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# THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

Supplement 81

Plant Diseases in the United States in 1930.

December 31, 1931.



BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

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BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE



# DISEASES OF PLANTS IN THE UNITED STATES IN 1930

Compiled by

M. F. Barrus, O. C. Boyd, and Jessie I. Wood

Plant Disease Reporter  
Supplement 81

December 31, 1931

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## INTRODUCTION

The summary of plant diseases in the United States in 1930 follows closely the plan of the summary of 1929 in both form and arrangement. Information already published in the "Plant Disease Reporter" for 1930, Volume 14, is not repeated but is referred to at the end of the discussion of each disease (P.D.R. page ).

As in the summary for 1929, no references are included in the present supplement. The convenience of these citations is appreciated but their inclusion involves considerable difficulty in choosing which papers to cite and is largely a duplication of information already in the hands of readers.

In this connection, it is perhaps worthwhile to call attention to the bibliographic service regularly rendered by the Bureau of Plant Industry. For many years the Bureau of Plant Industry has continued to send, without charge, to botanists the bi-weekly list of botanical literature compiled by Miss Alice Atwood. This service, which may be had on request by any working botanist is one of the quickest and the most satisfactory bibliographic services in the world.

In the actual preparation of this summary the section on vegetable diseases was largely prepared by Dr. O. C. Boyd and those on fruit diseases and truck crops by Dr. M. F. Barrus. The long field experience of these gentlemen and their interest in survey problems has resulted in a much better summary than could have been produced by the staff of the Plant Disease Survey working unassisted. General editorial supervision has been in the hands of Miss Jessie I. Wood, who has prepared the remaining portions of the manuscript.

A list of collaborators of the Plant Disease Survey is given below, as individual contributions cannot well be indicated. The continued cooperation of these investigators makes possible the work of the Plant Disease Survey.

N. E. S.



LIST OF COLLABORATORS FOR THE YEAR 1930

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HAITI, Port au Prince, Haiti - H. D. Barker.

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PORTO RICO, Insular Experiment Station, Rio Piedras - M. T. Cook.

#### WEATHER CONDITIONS

The outstanding feature of the 1930 season was, of course, the severe and widespread drought, and the unusually warm weather which accompanied it throughout most of the country. The drought began as early as December 1929 in Maryland, Delaware, Virginia, and West Virginia, and continued throughout the year, while the area affected increased in extent until it included every State east of the Rocky Mountains. In many sections all previous records for dry weather were broken, both for individual months and for groups of months. (Tables 12, 13, 14 and Figures 1 and 2).

In the area most severely affected, that is, roughly, the region from Delaware south to Virginia, and west to Missouri and Arkansas, the drought was by far the most important factor in crop yields. With many crops the reduction in yield due to dry weather far overbalanced the generally decreased losses from disease. On the other hand, in the case of crops that were harvested before the lack of moisture became too severe, there was an increase in yield. This was true of the small grains and also of potatoes in certain sections. The maps in Figures 3 to 7 show the percentages of reduction or increase in yield per acre of certain crops in 1930 as compared with the average for 1919 to 1928. No assumption that either increase or decrease is due to the drought alone is intended, but comparison of these maps with those showing percentage of normal precipitation (Figures 1 and 2) suggests some interesting correlations.



Table 12. Departures from the normal temperature (F°.) by sections, March to October, 1930. (Figures from Climatological Data, 1930).

Departures from the normal temperature								
Section:	March	April	May	June	July	August	Sept.	Oct.
N. Eng.	+0.1	-1.3	+1.6	+4.6	-0.4	+0.6	+3.2	-0.4
N. Y.	+0.2	-1.2	+2.0	+2.9	+0.2	+0.1	+2.9	-1.1
N. J.	+1.6	-1.7	+2.6	+2.6	+0.9	-0.7	+4.1	-2.3
Pa.	+0.4	-0.6	+1.7	+0.9	+1.1	+0.3	+3.8	-1.6
Md. Del.	-0.2	-1.9	+2.3	+1.3	+1.9	+0.5	+5.5	-2.2
Va.	-1.3	-0.1	+3.3	+0.4	+3.1	+0.5	+5.7	-2.8
W. Va.	-2.3	+1.6	+1.3	-0.2	+1.8	-1.1	+3.5	-4.2
Ky.	-1.8	+2.9	+1.2	-0.7	+3.7	+0.9	+2.2	-2.4
Tenn.	-2.1	+2.5	+1.3	-0.2	+4.3	+1.0	+2.7	-1.9
N. C.	-2.3	+1.1	+2.4	-1.1	+2.2	-1.4	+4.0	-3.4
S. C.	-3.9	+1.1	+1.1	-2.3	+2.1	-1.3	+2.7	-3.1
Ga.	-4.3	+1.5	+2.0	-1.8	+2.6	-0.8	+2.5	-2.4
Fla.	-3.7	+0.2	+1.0	-1.9	+1.2	-0.8	+1.3	-2.0
Ala.	-3.7	+2.0	+1.5	-0.9	+3.6	-0.1	+1.6	-1.9
Miss.	-2.8	+2.3	+1.2	-0.6	+3.6	+0.4	+1.2	-1.6
La.	-4.	+2.2	+0.9	-1.1	+1.8	+0.1	+0.2	-0.8
Tex.	-3.6	+4.1	-0.5	-0.7	+1.1	+1.4	+2.0	-1.5
Okla.	-1.8	+5.9	-0.4	-0.2	+2.4	+2.6	+3.3	-1.2
Ark.	-2.3	+3.5	-0.2	-0.7	+4.7	+2.1	+1.5	-2.1
Ohio	-1.0	+2.4	+2.7	+0.9	+2.2	+0.4	+2.1	-2.8
Ill.	-0.3	+3.2	+1.6	-0.2	+4.2	+2.0	+2.1	-1.7
Ind.	-1.3	+2.0	+1.4	-0.6	+2.1	+1.1	+1.4	-1.7
Mich.	0.0	+0.5	+2.5	+1.5	+0.5	+2.2	+1.7	-1.2
Wis.	+1.2	+1.9	+1.9	+1.7	+1.6	+3.1	+1.1	-1.3
Minn.	+1.7	+3.2	+0.4	+1.3	+2.7	+4.3	+0.3	-1.1
Iowa	+2.7	+3.2	+0.1	-0.3	+4.2	+2.7	+2.0	-1.1
Mo.	-0.7	+4.0	+0.3	-0.8	+3.9	+2.5	+2.3	-2.1
N. Dak.	+3.5	+5.6	-1.8	+0.5	+4.8	+5.0	-0.2	-3.0
S. Dak.	+1.3	+5.4	-0.0	0.0	+6.0	+4.3	+0.7	-2.4
Nebr.	+1.0	+4.6	-1.7	-0.8	+4.1	+1.7	+1.4	-0.6
Kans.	-1.5	+5.0	-0.8	-0.5	+3.2	+2.3	+1.4	-2.0
Mont.	+0.4	+7.4	+0.3	+0.5	+3.4	+4.3	+1.4	-4.3
Wyo.	-0.7	+8.0	-0.3	-0.6	+2.2	+1.3	+0.1	-1.6
Colo.	-1.3	+6.2	-1.9	+0.8	+1.1	+0.7	+0.1	-0.4
N. Mex.	-2.3	+4.6	+2.5	+0.8	-0.6	+0.6	+0.1	0.0
Ariz.	-1.0	+4.0	-4.5	+0.5	-0.8	-0.3	-1.4	-1.4
Utah	+1.2	+6.1	-3.1	+0.7	+1.2	+0.3	-0.2	-1.8
Nev.	+1.2	+4.0	-3.7	+1.5	+0.6	-0.1	-1.0	-1.7
Idaho	+2.0	+5.9	-1.0	-1.1	+1.6	+2.3	+1.2	-1.7
Wash.	+2.2	+3.7	-0.9	-1.7	0.0	+1.9	+1.5	-2.4
Oreg.	+2.5	+3.8	-1.6	-1.1	0.0	+1.5	+1.0	-1.5
Calif.	+1.3	+1.5	-3.7	+0.5	-0.4	-1.1	-3.3	-0.7

Table 13. Departures from the normal precipitation (inches) by sections, March to October, 1930. (Figures from Climatological Data, 1930).

Section:	Departures from the normal precipitation							
	March	April	May	June	July	August	Sept.	Oct.
N. Eng.	+0.37	-1.61	+0.23	+0.06	+0.07	-1.33	-1.92	-0.58
N. Y.	+0.52	-0.90	+0.11	+0.63	-0.96	-1.41	-0.74	-1.80
N. J.	-1.32	-1.31	-0.98	+0.47	-0.66	-1.61	-1.44	-1.45
Pa.	-0.51	-0.66	-0.96	+0.10	-2.12	-2.76	-1.03	-2.19
Md. Del.	-1.52	-0.88	-1.38	-0.66	-2.75	-3.15	-1.79	-2.04
Va.	-1.64	-1.06	-1.33	-0.98	-2.83	-2.76	-1.95	-1.76
W. Va.	-0.73	-1.57	-1.74	-1.60	-2.59	-1.95	-1.57	-2.16
Ky.	-2.52	-2.72	-1.04	-2.49	-2.89	-1.48	-0.37	-1.44
Tenn.	-0.61	-2.82	+1.45	-2.90	-2.05	-1.40	+0.23	-0.20
N. C.	-1.50	-1.53	-0.99	-0.10	-2.24	-2.72	-0.44	-1.12
S. C.	-0.57	-0.91	-1.17	-0.44	-1.07	-3.33	+0.39	-0.84
Ga.	+0.98	-0.32	-1.24	-0.57	+0.01	-3.32	+2.54	-1.09
Fla.	+4.31	+0.82	+0.21	+3.99	-2.75	-2.68	+1.88	-1.62
Ala.	-0.09	-2.82	-0.15	-2.31	-1.49	-1.04	+3.11	+0.10
Miss.	-1.70	-3.69	+4.77	-3.70	-2.37	-1.14	+1.58	+0.53
La.	-1.04	-3.32	+1.43	-4.19	-2.43	-0.56	+3.15	+1.32
Tex.	-1.73	-1.30	+1.49	-1.13	-1.55	-1.05	-0.98	+3.65
Okla.	-1.64	-0.74	+1.68	-0.29	-1.63	-1.25	-1.05	+1.09
Ark.	-2.53	-3.47	+5.04	-3.15	-3.08	-1.16	+0.67	+1.92
Ohio	-0.66	-1.12	-1.82	-1.55	-2.30	-1.09	-0.26	-1.35
Ill.	-1.67	-0.73	-2.16	-0.50	-2.27	-1.50	+0.02	-0.40
Ind.	-2.04	-0.94	-2.22	-1.23	-1.62	-1.24	+0.50	-1.15
Mich.	-0.56	-0.73	-0.14	+0.30	-1.55	-2.07	-0.91	-0.77
Wis.	-0.45	-0.54	-0.35	+1.30	-1.11	-2.23	-0.56	-0.25
Minn.	-0.62	-0.97	+1.09	-0.24	-1.01	-2.11	+0.46	-0.37
Iowa	-0.88	-0.29	-0.06	+1.33	-2.34	-1.02	-1.36	-0.35
Mo.	-1.65	-1.78	-1.24	-1.04	-3.03	-1.73	+0.34	+0.17
N. Dak.	-0.74	-0.13	+0.07	-0.41	-1.57	-0.83	-0.62	+0.81
S. Dak.	-0.53	+0.01	-0.32	-0.79	-1.85	+0.43	-0.53	+0.87
Nebr.	-0.68	+1.23	+1.57	-0.56	-1.84	+1.33	-0.53	+1.07
Kans.	-1.15	+0.23	+0.57	-0.09	-1.33	-0.24	+0.12	+1.72
Mont.	+0.03	+0.24	-0.88	-1.09	-0.54	-0.13	+0.21	+0.45
Wyo.	-0.10	-0.71	+0.18	-0.46	-0.14	+2.26	-0.46	+0.73
Colo.	-0.44	-0.82	+0.61	-0.77	+0.96	+1.18	-0.34	-0.32
N. Mex.	-0.02	-0.42	-0.01	-0.33	+0.86	-0.34	-0.49	+0.70
Ariz.	+0.92	-0.23	+0.59	+0.07	+0.97	+0.07	-0.10	-0.53
Utah	-0.33	-0.42	+0.38	-0.16	+0.21	+1.37	+0.67	-0.17
Nev.	-0.31	+0.01	+1.34	-0.34	-0.21	+0.36	+0.47	-0.03
Idaho	-0.25	+0.20	+0.50	-0.47	-0.31	+0.58	+0.09	+0.15
Wash.	-0.71	-0.24	+0.11	-0.13	-0.59	-0.70	-0.46	-0.31
Oreg.	-1.39	-0.07	+0.42	-0.49	-0.39	-0.29	-0.02	-0.61
Calif.	-0.56	-0.14	+0.37	-0.28	-0.07	-0.02	-0.02	-0.84

Table 14. Percentage of normal rainfall, 1930. (From Weekly Weather and Crop Bulletin, Oct. 14, 1930). Underlined figures indicate least precipitation of record.

Percentage of normal rainfall, 1930.												
States	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Jan. to Sept.	Mar. to Aug.	July and Aug.
Ky.	112	101	46	33	73	42	<u>30</u>	60	86	63	47	45
Md. and Del.	82	68	59	74	62	<u>83</u>	<u>37</u>	26	44	<u>58</u>	55	<u>31</u>
Va.	80	48	56	67	65	77	<u>39</u>	<u>40</u>	41	<u>56</u>	<u>56</u>	<u>39</u>
Mo.	221	81	45	53	73	79	<u>24</u>	<u>54</u>	109	75	<u>57</u>	<u>39</u>
Ill.	208	104	48	79	46	87	<u>31</u>	57	101	78	<u>58</u>	44
Ind.	209	98	47	73	45	68	<u>52</u>	63	116	82	<u>58</u>	57
W. Va.	49	85	82	55	56	<u>64</u>	<u>42</u>	54	48	<u>59</u>	<u>59</u>	<u>48</u>
Ohio	162	116	81	65	50	<u>60</u>	<u>40</u>	68	91	77	<u>60</u>	<u>53</u>
La.	166	78	78	29	132	<u>13</u>	61	89	180	89	<u>66</u>	74
Ark.	223	117	47	29	200	<u>22</u>	19	70	121	95	68	<u>44</u>
N. C.	94	33	65	59	76	<u>98</u>	62	50	90	69	68	56
Tenn.	105	94	89	37	134	<u>33</u>	54	65	106	<u>79</u>	69	59
Pa.	68	101	86	80	76	102	51	<u>35</u>	72	<u>73</u>	<u>71</u>	<u>43</u>
Mich.	118	104	75	71	96	109	47	27	69	77	71	37
Ala.	88	43	98	34	96	46	73	77	196	80	72	75
Miss.	107	69	71	23	208	<u>13</u>	52	74	156	81	72	62
S. C.	125	26	86	70	68	91	82	42	110	76	72	62
N. Dak.	54	241	<u>11</u>	91	103	88	40	64	62	76	73	51
Mont.	57	82	<u>103</u>	121	59	58	68	90	114	79	76	77
Oreg.	68	104	55	97	123	61	11	43	96	82	76	28
Minn.	88	171	44	52	136	94	71	<u>34</u>	120	87	77	54
N. J.	81	78	66	64	74	113	86	67	56	76	78	77
Tex.	99	82	84	60	141	66	41	59	67	78	78	50
Wash.	46	129	79	91	105	92	11	24	80	82	<u>80</u>	18
S. Dak.	88	101	50	100	90	77	34	118	76	80	<u>80</u>	72
Iowa	125	55	50	90	81	130	39	70	63	79	81	54
Okla.	173	97	27	80	136	93	38	59	65	84	81	49
Wis.	94	120	74	79	91	133	70	32	84	85	82	52
Ga.	118	32	121	91	65	37	100	36	173	88	84	70
Kans.	148	27	20	109	115	98	60	92	104	90	89	75
Calif.	97	65	85	92	134	10	22	80	100	86	90	53
N. Y.	107	63	117	70	103	117	76	63	84	88	90	69
N. Eng.	79	64	127	50	107	102	102	66	48	83	92	83
N. Mex.	117	37	98	58	99	76	132	86	68	91	97	110
Idaho	71	120	84	114	131	66	54	181	114	101	103	120
Nebr.	140	54	38	150	145	85	45	147	<u>77</u>	102	106	92
Colo.	155	68	67	57	134	49	140	160	72	103	107	149
Wyo.	95	82	90	55	108	70	90	331	61	103	112	191
Fla.	126	99	241	131	105	159	<u>62</u>	62	126	115	113	<u>62</u>
Utah	134	84	77	69	129	74	121	214	162	119	115	172
Nev.	128	75	67	101	256	32	43	182	214	121	122	119
Ariz.	174	41	181	65	269	118	144	103	80	123	135	124
United States. (State means weighted by respective areas.)												
Average												
precipitation	2.6	1.7	2.0	1.8	3.2	2.3	1.3	2.0	2.7	20.1	13.1	3.8
Normal	2.3	2.2	2.4	2.5	2.9	2.9	2.3	2.6	2.4	23.0	16.1	5.4
Percentage												
of normal	113	77	83	72	110	79	64	77	112	87	81	70



## Percentage of Normal Precipitation, 1930, by States

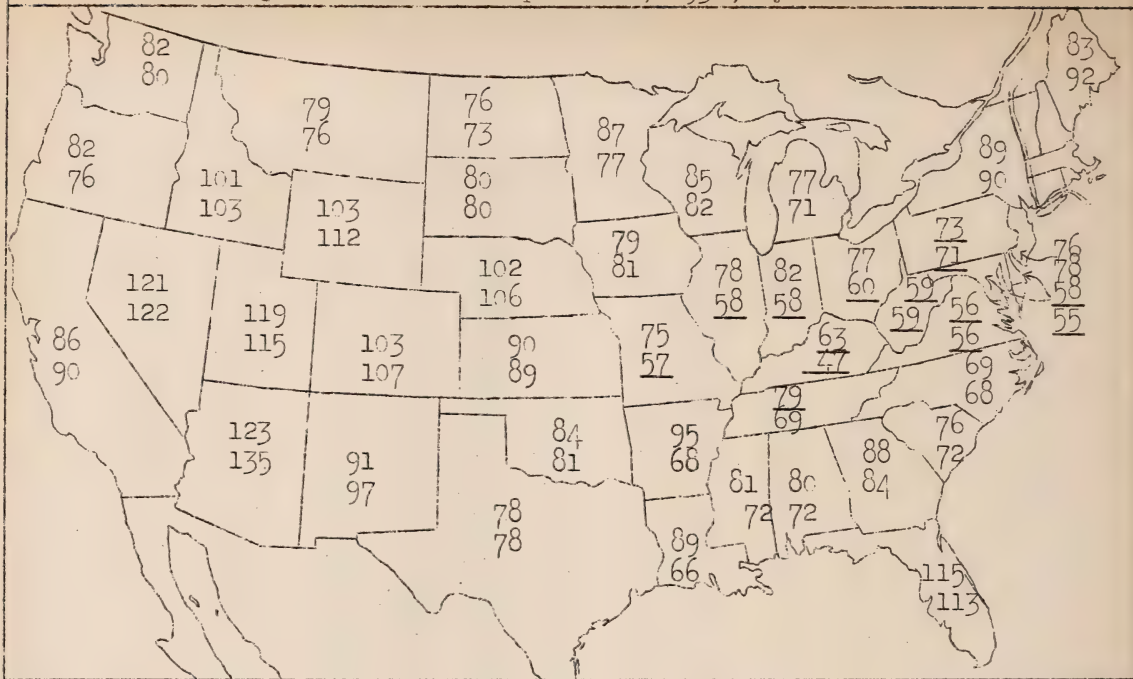


Fig. 1. Upper figures show percentage of normal, Jan. 1 to Sept. 30, lower figures, Mar. 1 to Aug. 31. (Weekly Weather & Crop Bul. Oct. 14, 1930)

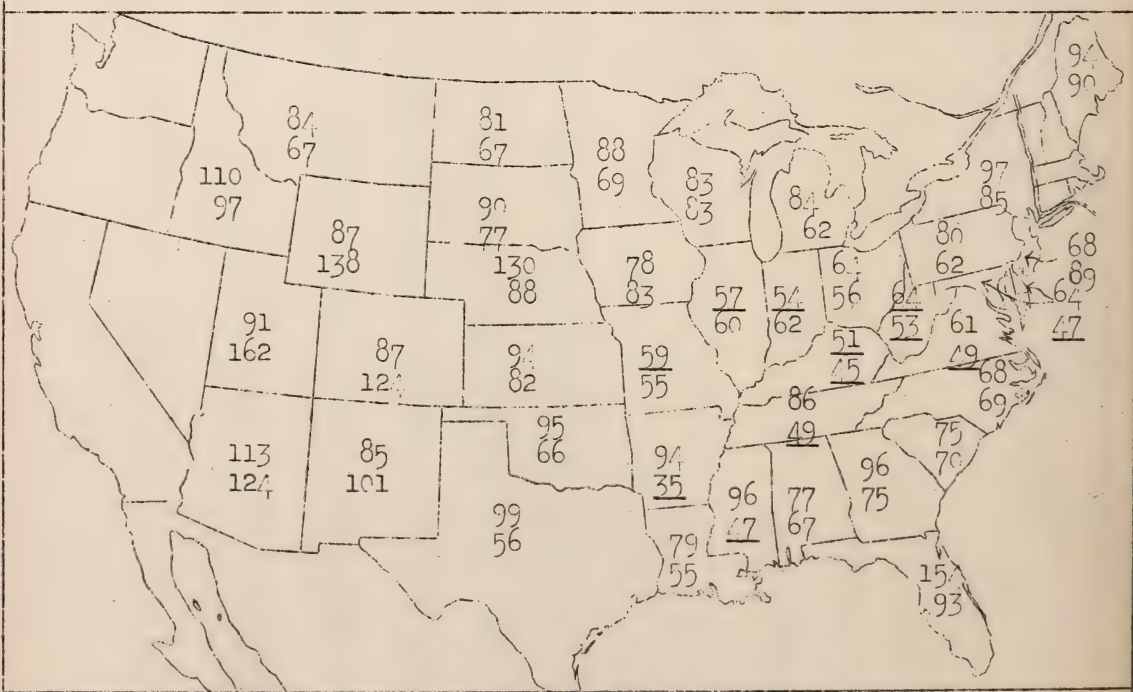


Fig. 2. Upper figures show percentage of normal for the spring of 1930 (March to May, inclusive), lower figures for the summer (June to August, inclusive). (Weekly Weather & Crop Bul., Sept. 9, 1930).

In both maps underlined figures indicate the driest of record.



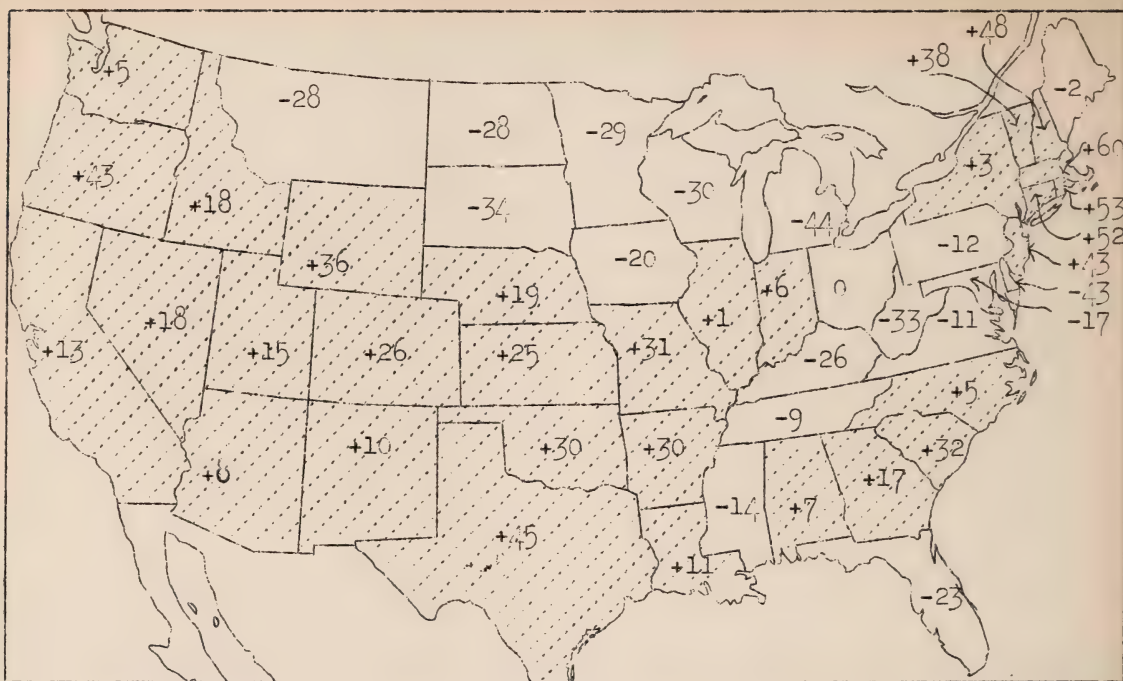


Fig. 5. Percentage reduction or increase in yield per acre of potatoes in 1930 from the average 1919-1928.

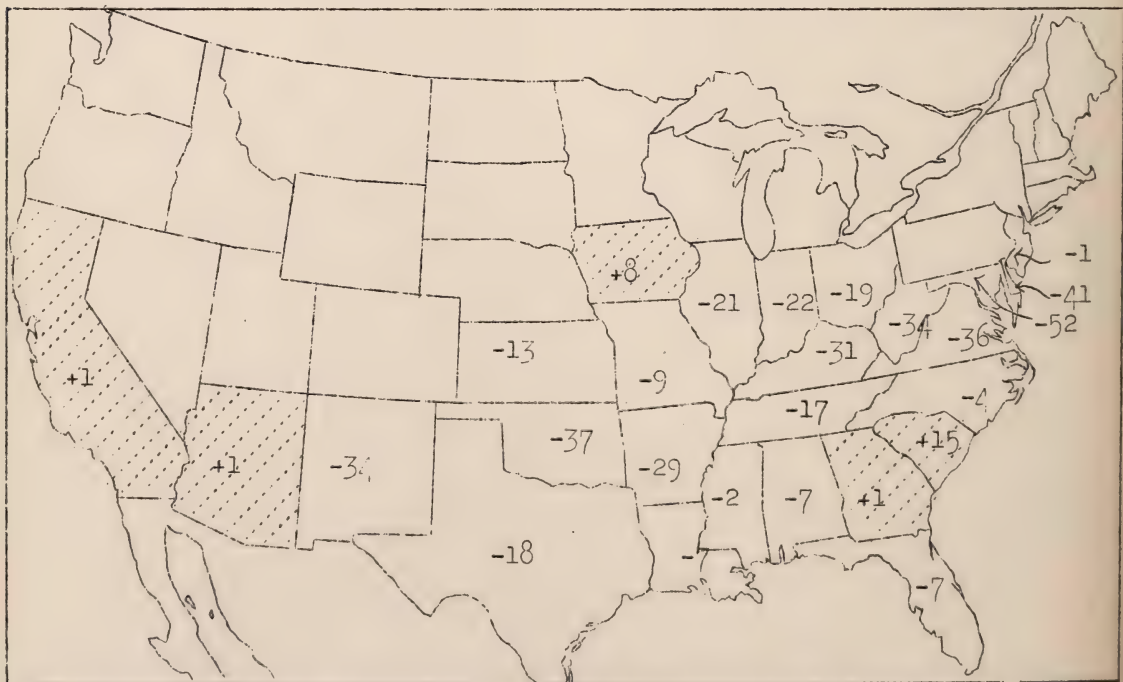


Fig. 6. Percentage reduction or increase in yield per acre of sweet potatoes in 1930 from the average 1919-1928.



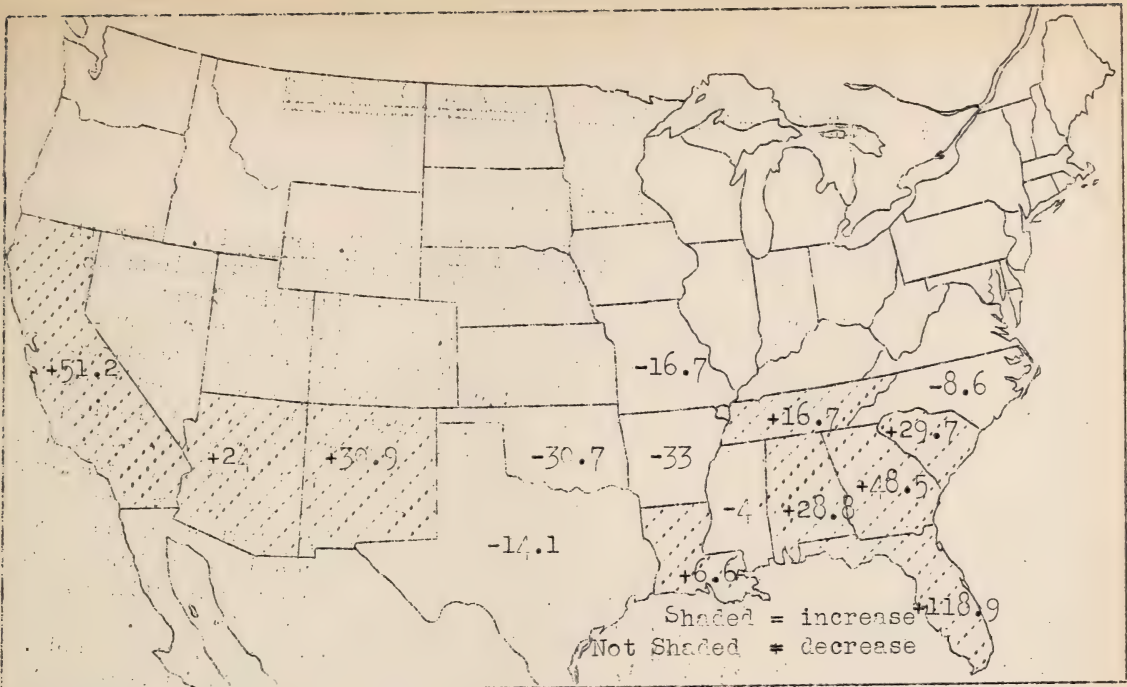


Figure 7. Percentage reduction or increase in yield per acre of cotton in 1930 from average yield per acre 1919-1928.

Losses from disease were generally much less than normal in 1930. Outstanding examples are stem rust, leaf rust, and scab of small grains, potato late blight except in Florida, Septoria blight of tomatoes, apple scab in the drought area, and peach brown rot. Others will be noted in the summary. Certain diseases, however, showed increased destructiveness. These include, naturally, potato tipburn and blossom-end rot of tomato, and also potato scab, non-parasitic "rust" of cotton, and others. The effects of many wilts and root rots were so obscured by the similar symptoms produced by the dry weather and heat that estimates of loss due to these are of very doubtful value.

D I S E A S E S   O F   C E R E A L   C R O P SW H E A T

STINKING SMUT OR BUNT (*Tilletia levis* and *T. tritici*). For the country as a whole this disease probably caused about as much loss as it did in 1929. There was the same amount in the Atlantic Coast States except North Carolina, and in Montana, the only State reporting this year from the Northwest where the disease is usually destructive. The loss of 2 per cent in North Carolina was less than had been reported from that State for several years. Kansas, Texas, and Indiana also reported reduced loss. In Colorado the loss of 2 per cent, although larger than the very small amount reported last year, showed nevertheless a continued reduction from other preceding years since 1925. On the other hand, losses were from slightly to considerably greater in the area from Michigan west to North and South Dakota, in Wisconsin and Minnesota being larger than for ten years past. Nebraska reported that stinking smut was probably the most important disease of the crop in 1930. The loss in that State continues high in spite of seed treatment propaganda. The results of a survey conducted during the summer of 1930 in selected spring wheat counties of Minnesota, the Dakotas, and Montana showed that a large part of the failure to control stinking smut, leading to increased losses in those States, was due to the use of wrong methods of treatment or to the faulty application of approved methods. (A complete report of the results of this survey is given in Supplement 77, "Why so much smut in spring wheat?" November 1, 1930). The contrasting situation of marked decrease in loss in Pennsylvania, Kansas, and Colorado is probably due chiefly to intensive seed treatment with copper carbonate. Seed was treated for over 2,000,000 acres of the 1930 crop in Kansas. The 1930 season was apparently favorable for the development of the disease in Kansas, as much as 80 per cent infection having been observed in individual fields. Losses reported in 1930 are given in Table 15 and Figure 8. The average loss for the ten-year period, 1920-1929 is shown in Figure 9.

The importance of smut in the harvested grain is discussed in Supplement 79 ("The relation of stinking smut in the field to smuttiness of threshed grain," June 1, 1931) which reports an attempt to determine the amounts of smut in threshed wheat likely to result from various percentages of infection in the field. Samples of threshed grain were received from 52 fields that had been inspected during the smut survey and comparisons were made between the percentages of smut in the fields and the smuttiness of the samples. Other factors beside field infection are concerned, but it was found that in this small number of samples



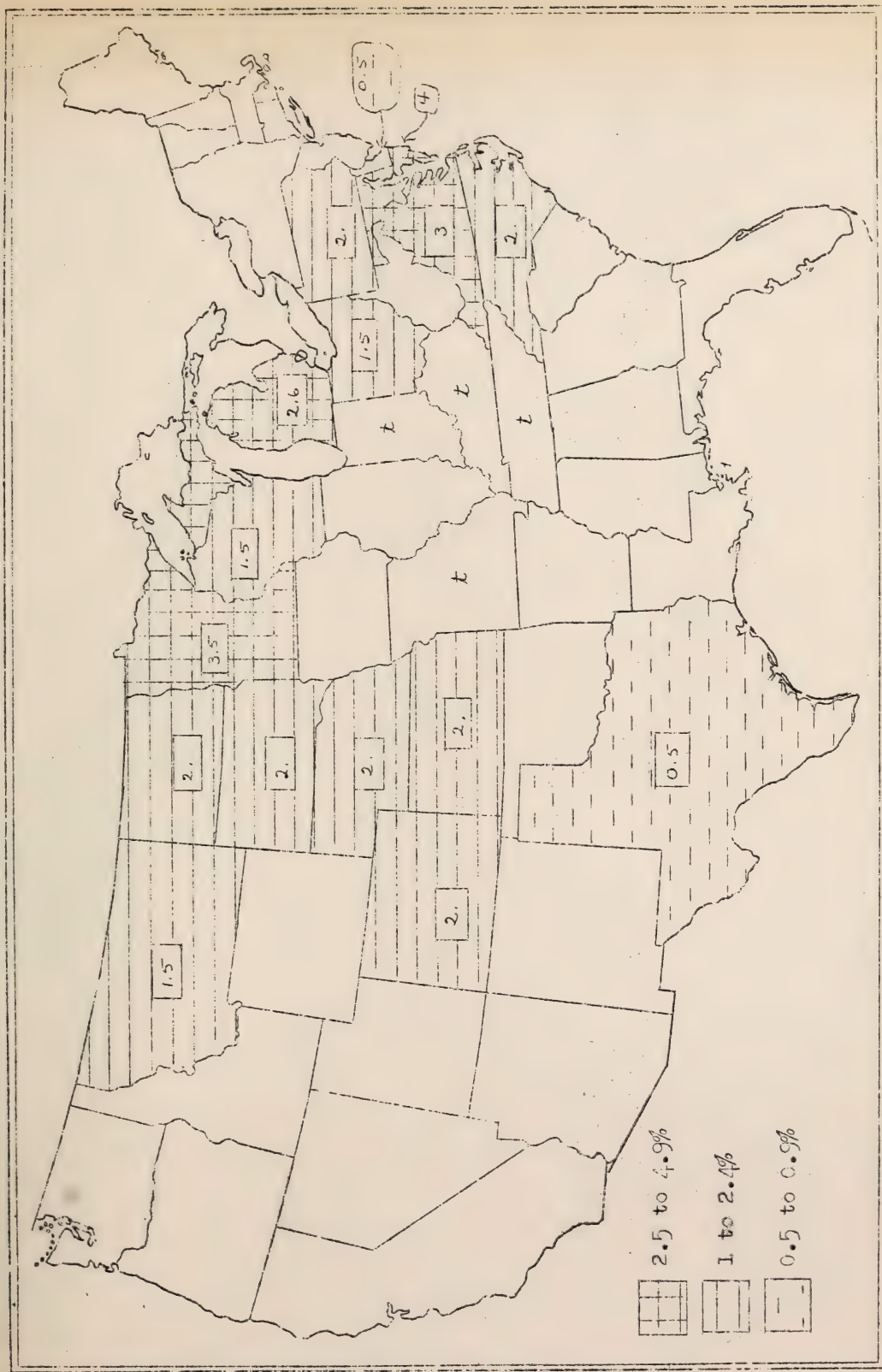


Figure 8. Estimated percentage losses from stinking smut of wheat in 1930, as reported by collaborators.

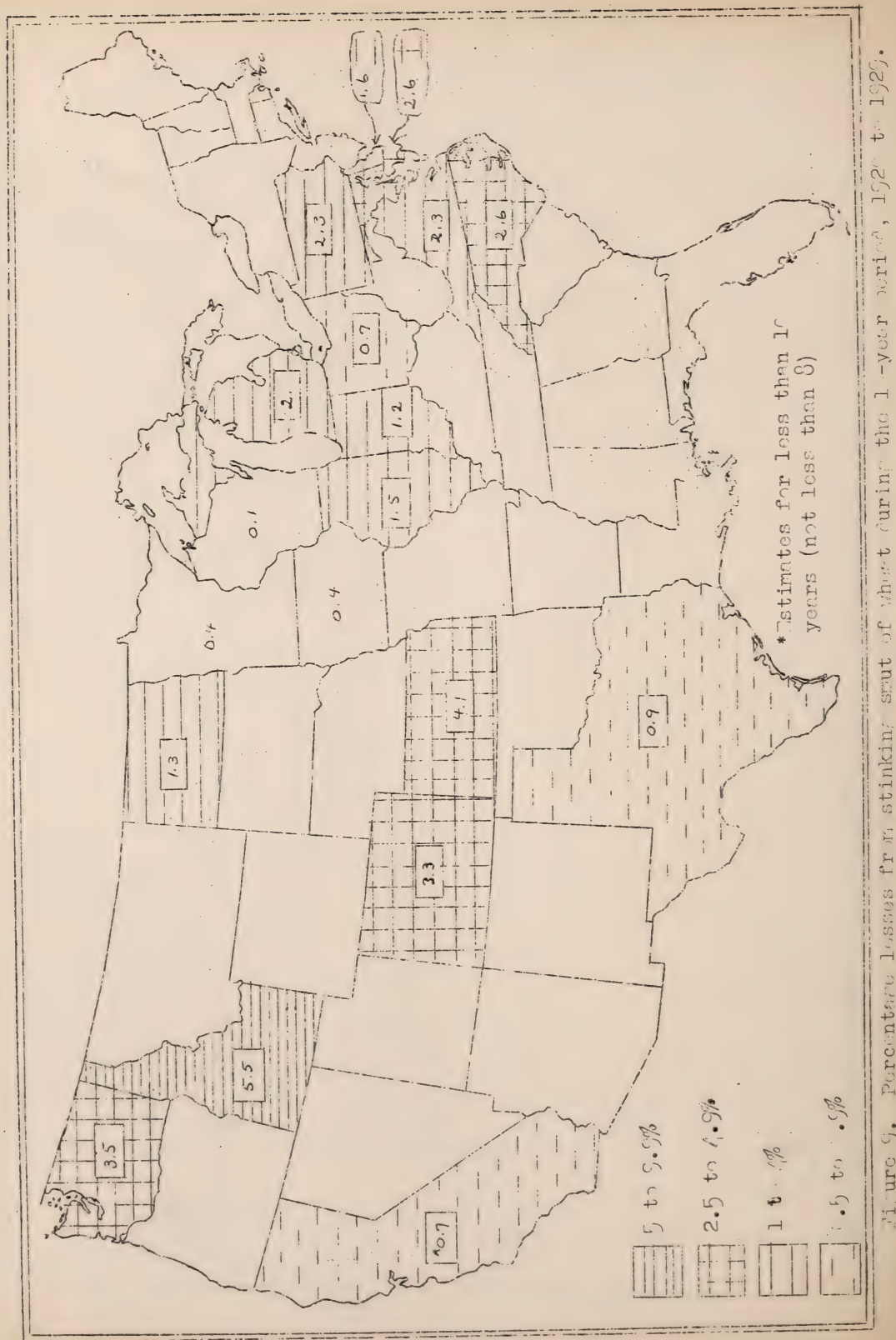


Figure 9. Percentage losses from stinking smut of wheat during the 1-year period, 1920 to 1929.



some correlation did exist. In view of the increasing importance of smut in durum wheat during the last few years the results obtained when these samples were classified according to the types of wheat are interesting. Of the 33 samples of hard red spring varieties, 36 per cent were found to be smutty when graded, and of the 19 durum varieties, 53 per cent, or more than half, were smutty. Besides this, a larger proportion of the durum than of the hard red spring wheat showed heavy smut.

Table 15. Losses from stinking smut of wheat as estimated by collaborators, 1930.

Percentage: loss	States reporting	Percentage: loss	States reporting
4.0	Maryland	1.5	Wisconsin, Montana
3.5	Minnesota	0.5	Texas, Delaware
3	Virginia	Trace	West Virginia, Tennessee, Missouri, Indiana, Kentucky
2.6	Michigan		
2	Pennsylvania, Nebraska:		
	Kansas, Colorado, North:		
	Dakota, South Dakota, :		
	North Carolina		

LOOSE SMUT (*Ustilago tritici*). In general loose smut was of about the normal prevalence. Kansas reported more than for the past ten years, due perhaps to heavy rains at flowering time in 1929. The greatest damage was done to soft wheats in eastern Kansas but unusual amounts occurred on winter wheat throughout the State. In most years heavy infections are observed only in the northeastern counties. The total loss for the State was estimated at 2.25 per cent. The disease was severe in Missouri, causing a loss of 4 per cent, which is much more than usual. On the other hand, in North Dakota there was much less loose smut than last year. In North Carolina, although prevalent, the disease caused less loss than for the past two years. Estimated percentage losses are shown in Table 16.

Table 16. Losses from loose smut of wheat as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
4	Missouri	0.3	Illinois
2 to 3	West Virginia	0.25	Kansas
2	Virginia, Indiana	0.2	Michigan
1.5	New York, Pennsylvania	0.1	Wisconsin
	Georgia, South Dakota	Trace	Delaware, North
1	Texas		Carolina, Minnesota,
0.5	Maryland, Arkansas,		Nebraska, Colorado
	Montana		

FLAG SMUT (*Urocystis tritici*) is still known to occur only in Illinois, Missouri and Kansas. Results of a brief resurvey conducted during 1930 have been published in the Reporter, Volume 14, Pages 86, 89, 101. The situation as regards flag smut is summarized by A. G. Johnson in a letter dated May 16 as follows: "In general I think the situation is not serious, as most infections are only a trace. It seems to me that the situation can be adequately handled by educational methods - resistant varieties, seed treatment, rotation, and care of infested straw."

STEM RUST (*Puccinia graminis*). In 1930 losses from stem rust were unusually small as will be seen from a comparison of Figures 10 and 11, showing losses for 1930 and for the period 1920 to 1929, respectively. In the area most affected by the drought, dry weather prevented rust development and high temperatures hastened ripening, so that in some States, notably Indiana and Illinois, the crop reached maturity with practically no infection. According to barberry eradication scouts stem rust caused some injury in southern Texas during May and by the end of the month there was more in northern Texas than at the same time last year. About the middle of May small spots of primary infection appeared in southern Kansas but low temperatures prevented spread until just before harvest. At that time the disease appeared in all parts of the State, being heaviest in north-central Kansas. Losses estimated are given in Table 17 and Figure 10.

P. D. R. 14: Pages 114, 115, 244.



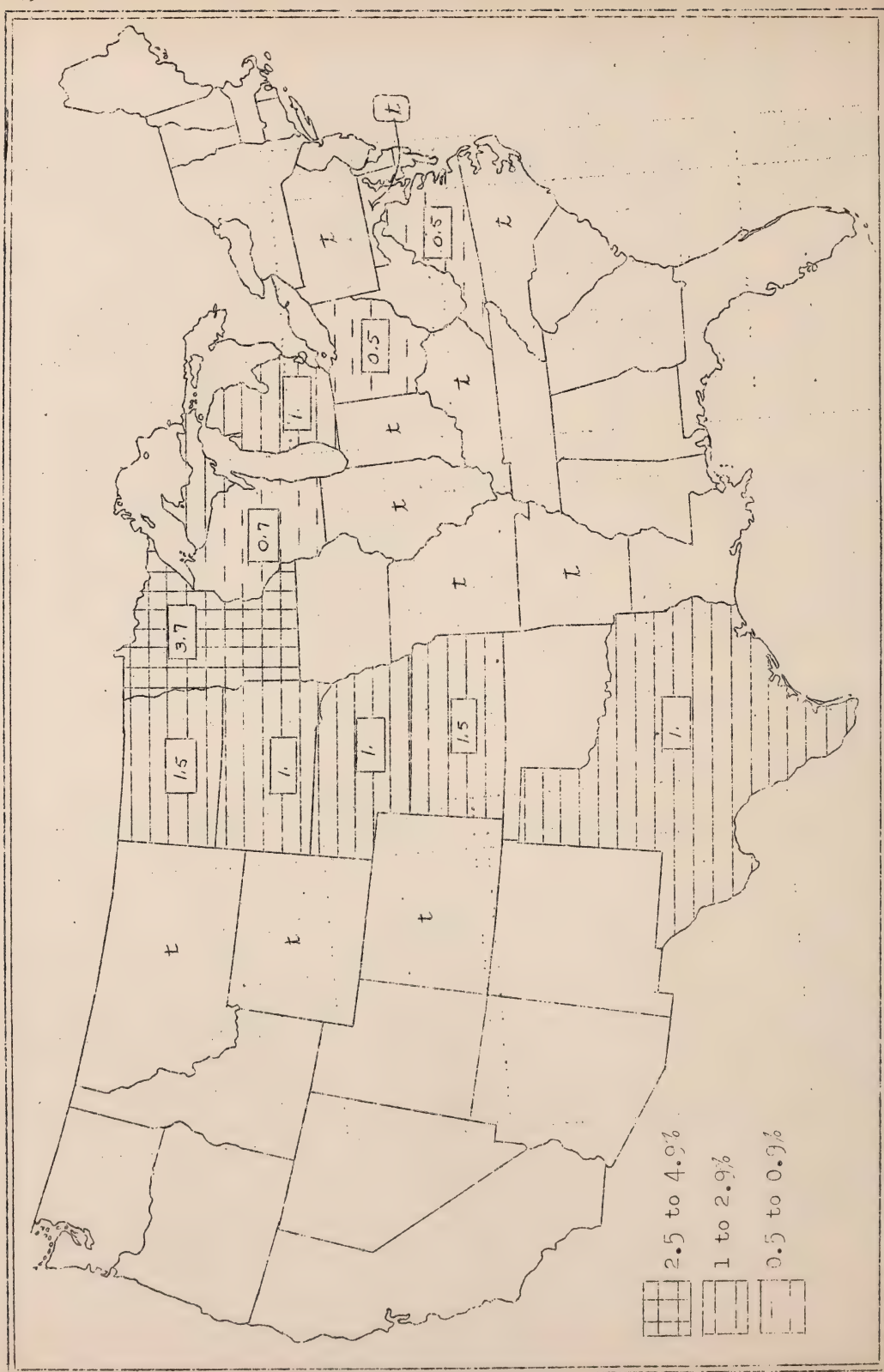
Table 17. Losses from stem rust of wheat as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
3.7	Minnesota	0.5	Virginia, Ohio
1.5	North Dakota, Kansas	Trace	Pennsylvania, Maryland
1.	Michigan, Texas,		North Carolina, Illinois
	South Dakota, Nebraska		Indiana, Kentucky,
			Missouri, Arkansas,
0.7	Wisconsin		Montana, Colorado,
			Wyoming

LEAF RUST (*Puccinia triticea*). Late appearance and lack of spread due to dry weather were responsible for the generally less than average prevalence of leaf rust. Pennsylvania reported much less than last year, when it was very severe in that State. In Kansas there was enough rain in early spring but the weather was too cool for rust development until very late. Early fields escaped but late plantings suffered from heavy infection. In Georgia also there was severe late infection, particularly in southern Georgia. Losses are given in Table 18.

Table 18. Losses from leaf rust of wheat as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	Georgia	0.5	Delaware, Maryland,
			Missouri, Nebraska
3	Kansas	0.1	Texas, Wisconsin, Montana
2	Virginia	Trace	Kentucky, North Carolina,
1.5	Illinois		Indiana, Minnesota,
			Arkansas, North Dakota,
			South Dakota





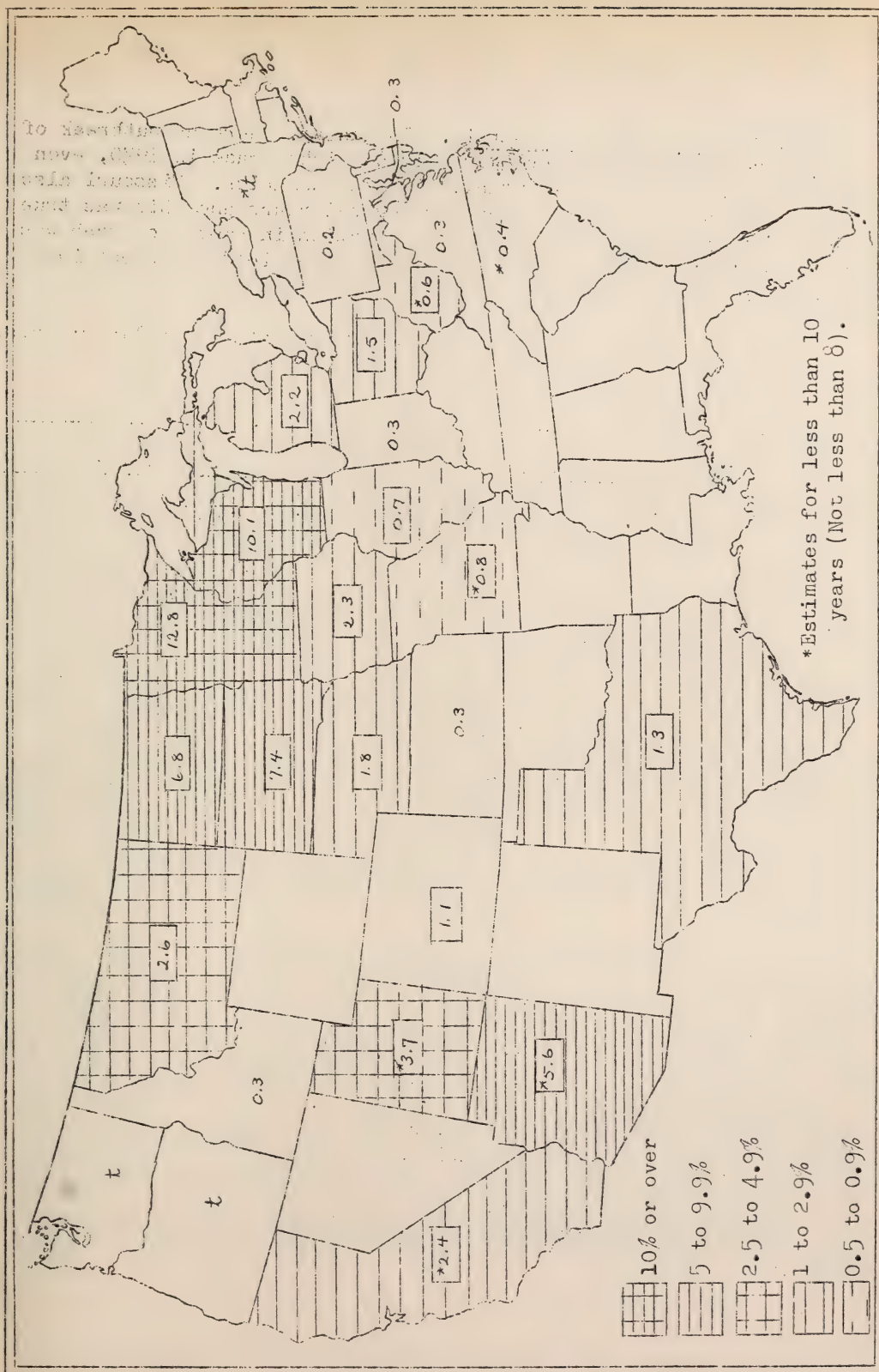


Figure 11. Percentage losses from stem rust for the ten-year period 1920-1929.

SCAB (Gibberella saubinetii). In Kansas, where an outbreak of scab occurred last year, there was only a slight trace in 1930, even in the eastern part where it usually is most damaging. Missouri also reported scab as less severe than for several years and this was true of the majority of States reporting. Reduction in amount of scab was believed to be partly responsible for increased yields of wheat in Maryland. Losses given in Table 19.

Table 19. Losses from wheat scab as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
1.5	Virginia, Missouri	0.1	Wisconsin
1	Maryland	Trace	Delaware, Kentucky, Michigan, Nebraska,
0.5	North Carolina, Texas		Kansas
	Minnesota, South		
	Dakota		

GLUME BLOTCH (Septoria nodorum) appeared to be exceptionally abundant last spring in Kentucky, in spite of (or because of) the very dry season. As it was practically the only disease on the heads it was particularly prominent. The quality of the wheat was the best in many years. The actual injury from *Septoria* was probably low except on an occasional spike where the heads were shriveled. (W. D. Valleau). A loss of one per cent was reported from Maryland. P. D. R. 14: Pages 114, 145, 244.

SPECKLED LEAF BLOTCH (Septoria tritici) was severe again on hard red winter wheats in Kansas, causing more loss than it did in 1929. Apparently the very wet weather in early spring and rather low temperatures until June were favorable to its development. Leaves of such very susceptible varieties as Kanred, Turkey, and Blackhull were nearly all killed long before maturity. Oro and Newturk were also susceptible, while Fulhard and Kawvale appeared resistant, and Harvest Queen, Michigan Wonder, and Kooperatoroka very resistant. The total loss was estimated at 1.5 per cent. Illinois reported 0.5 per cent loss.

BASAL GLUME ROT (Bacterium atrofaciens) was severe locally in Kansas but the total loss for the State was only a trace. P. D. R. 14: Page 145.



TAKE-ALL (Ophiobolus graminis) was much more prevalent in New York than for several years. Losses as high as 20 per cent were reported in individual fields but in most cases the disease occurred only in small patches in the fields. The loss for the State was a trace (Chupp and Barrus). There was much more than usual in Kansas also. The total loss caused was one per cent but as much as 60 per cent was observed in fields (H. Fellows). A severe outbreak on spring wheat occurred in Jerome County in southern Idaho, the yield in some cases being cut at least 25 per cent. This seems to be the first report of take-all on spring wheat in the United States, although of course it is common in Canada and Australia. (Fellows and Hungerford).

HELMINTHOSPORIUM FOOT ROT (Helminthosporium sativum). Detailed inspections by P. A. Young and Hurley Fellows showed foot rot to be common and destructive in Montana wheat fields. Winter wheat especially was severely damaged to the extent of 10 per cent loss, while the loss in spring wheat was one per cent. Where winter wheat was planted late injury was not so great. Drought and foot rot combined destroyed spring wheat fields in some sections of the State. This combination probably increased losses in other States also. Foot rot was very prevalent in Kansas especially in the south-central and southwestern portions where drought in April injured the crop. In some cases the damage was as much as 60 per cent. The total loss was estimated at 0.3 per cent. In the Panhandle region of Texas the disease caused a loss of 5 per cent and losses of about one per cent were reported from Wisconsin and Minnesota.

FOOT ROTS were reported as becoming more serious each year in western Nebraska. Several organisms are concerned. Foot rot of undetermined cause was found at two places on the Columbia River in Clark and Skamania Counties, Washington.

WINTER BLIGHT (Sclerotium fulvum) was much less serious in Gallatin County, Montana, than it was in 1928 and 1929.

NEMATODE (Tylenchus tritici) was prevalent in certain sections of western North Carolina and northern Georgia. In North Carolina 75 to 80 per cent infection occurred in badly infested areas. In Georgia 15 per cent loss was estimated on three farms. The seed was grown locally and had been badly diseased for the past two years. One grower estimated his loss in 1929 to be much higher, as much as 50 per cent. P. D. R. 14: Page 144.

BREAKING-OVER of the straw and CRINKLE-JOINT (undet.). The breaking-over aroused considerable anxiety in some of the spring wheat States. Crinkle-joint was reported as more prevalent on wheat and barley in western Nebraska than usual. It was also reported from Kansas in connection with foot rots. P. D. R. 14: Pages 145, 157, 224.

MOSAIC (virus). A disease which was not definitely determined but which resembled mosaic was prevalent and destructive in several counties of northwestern Kansas. Many fields were plowed up on account of it. In material sent to him for examination, H. H. McKinney found definite cell inclusions resembling those associated with the wheat mosaic east of the Mississippi River. McKinney found traces of mosaic in all commercial fields examined in Illinois and he also found it in a field near Lexington, North Carolina. P. D. R. 14: Page 158.<sup>1</sup>

### R Y E

STEM RUST (Puccinia graminis) was even less important than it usually is on this crop. Losses reported did not exceed a trace and in some States there was no loss.

LEAF RUST (Puccinia dispersa) caused 10 per cent loss in Florida; 1 per cent in Virginia and Georgia; of very little importance elsewhere.

ERGOT (Claviceps purpurea) seemed to be much more severe than usual in New York, at least firms who buy the rye said that in cleaning the seed they found an unusually large amount of the sclerotia. It was so common that we received requests for information regarding the sale possibility of this ergot (Charles Chupp). Losses reported: 2 per cent in South Dakota; 1.5 in Wisconsin; 0.5 in Montana; traces in Michigan and Minnesota.

SCAB (Gibberella saubinetii) was very much reduced from last year. No loss greater than a trace was reported.

### B A R L E Y

COVERED SMUT (Ustilago hordei) and LOOSE SMUT (U. nuda). About the normal amount of both smuts was reported from most States in 1930. Covered smut was less prevalent in Kansas than it has been in recent years. Minnesota reported a considerable increase in both diseases, and loose smut was more prevalent than usual in Michigan, Wisconsin, and Kansas also. Wisconsin and Minnesota reported smooth-awned strains as especially susceptible. Concerning control, R. E. Vaughan in Wisconsin remarked, "We greatly need a treatment for loose smut that is better and more easily applied than hot water."

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<sup>1</sup>According to McKinney the disease occurring in northwestern Kansas in 1930 did not recur in 1931. As 1931 was an ideal year for the occurrence of mosaic it leaves some doubt as to whether this disease was a mosaic even though cell inclusions were found to be associated with it.



Losses from the two smuts are shown in Tables 20 and 21.

Table 20. Losses from covered smut of barley as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	Maryland	1.0	Kansas, Colorado
3	Virginia	0.5	Texas, Nebraska
2.	Minnesota, Montana	0.3	Michigan
1.5	South Dakota	Trace	Wisconsin

Table 21. Losses from loose smut of barley as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
3.0	Kansas	1	Maryland, Virginia, Texas, Montana, Nebraska
2.5	Minnesota	0.5	Connecticut
2.0	Wisconsin	0.1	Michigan
1.5	South Dakota	Trace	Delaware, Missouri

# STEM RUST (Puccinia graminis).

Table 22. Losses from stem rust of barley as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
0.5	Texas, Michigan, Minnesota, Iowa	0	Indiana, Montana
0.3	Nebraska	Trace	Maryland, Kentucky, Kansas, Wisconsin, Colorado, Wyoming,
0.1	Ohio		North Dakota, South Dakota, Nebraska

STRIPE (Helminthosporium gramineum).

Table 23. Losses from stripe of barley as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
1	Virginia, Wisconsin, Montana	Trace	Maryland
0.5	Michigan, Minnesota, South Dakota, Nebraska, Kansas		

SCAB (Gibberella saubinetii). In 1930, scab was much less prevalent on barley than during 1928 and 1929. The only appreciable loss reported was 2.5 per cent from Wisconsin. In other States reporting the loss did not exceed a trace.

SCALD (Rhynchosporium secalis) was said to be more prevalent than usual in Wisconsin. It became noticeable at about the beginning of July when hot weather started. The loss was estimated at 2 per cent. It is usually fairly abundant in northwestern Kansas, but only the barest traces were observed in 1930, and most fields seemed to be free.

BACTERIAL BLIGHT (Bacterium translucens) was of considerable importance locally in Minnesota. Twenty to sixty per cent damage was observed in fertilizer plots at Kenyon. The loss for the State was two per cent.

FOOT ROT (Helminthosporium sativum) was common and serious in many fields inspected in Montana.

O A T S

SMUTS (Ustilago avenae and U. levis). The accompanying maps, Figures 12 and 13, show the percentage reported during 1930, and the average for the period 1920 to 1929. Increasing amounts of smut have been reported from certain sections of the Middle West during the last few years. Thus, in Missouri and Kansas, losses reported from 1919 to 1927 had not exceeded 4 per cent. In Missouri, the loss in 1927 was 5 per cent, in 1928 6 per cent, and 1929, 11 per cent. In 1930, 8 per cent loss was estimated, less than in 1929 but still decidedly more than in other years. In Kansas, the loss jumped from only 0.5 per cent



in 1925 to 1927, to more than 5 per cent in 1928 and 1929. In 1930, it increased again to 6 per cent. Fulghum and Kanota often were badly smutted. The increased amount of smut in Kansas is believed to be due to the development of some new physiologic strains able to attack varieties hitherto regarded as resistant, together with neglect of seed treatment. In Arkansas, smut was considerably more destructive in 1930 than it had been in recent years. Losses from both smuts are shown in Table 24.

Table 24. Losses from loose and covered smuts of oats as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	Massachusetts, Arkansas	3	Wisconsin, Minnesota
8	Missouri	2.5	South Dakota
7	Maine	2	South Carolina, Indiana, Michigan, Texas, Nebraska
6	Kansas, Montana	1	Colorado
5	Maryland, Florida	0.1	Georgia
4	New York, Virginia	Trace	North Carolina, Delaware

STEM RUST (*Puccinia graminis*) was of unusually slight importance on oats. No loss greater than 1 per cent was reported. The first record of stem rust of oats in the Palouse Country was reported by F. D. Heald, who stated that a field of Markton oats on the College Farm at Pullman, Washington, showed at least 10 percent of the culms infected at harvest time.

Table 25. Losses from stem rust of oats as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
1	Connecticut, Texas	0.1	Ohio
0.5	Michigan, Minnesota	Trace	Massachusetts, Wisconsin, North Dakota, South Dakota,
0.3	South Carolina		Nebraska, Kansas,
0.2	Iowa		Maryland, Arkansas,
			Montana, Wyoming

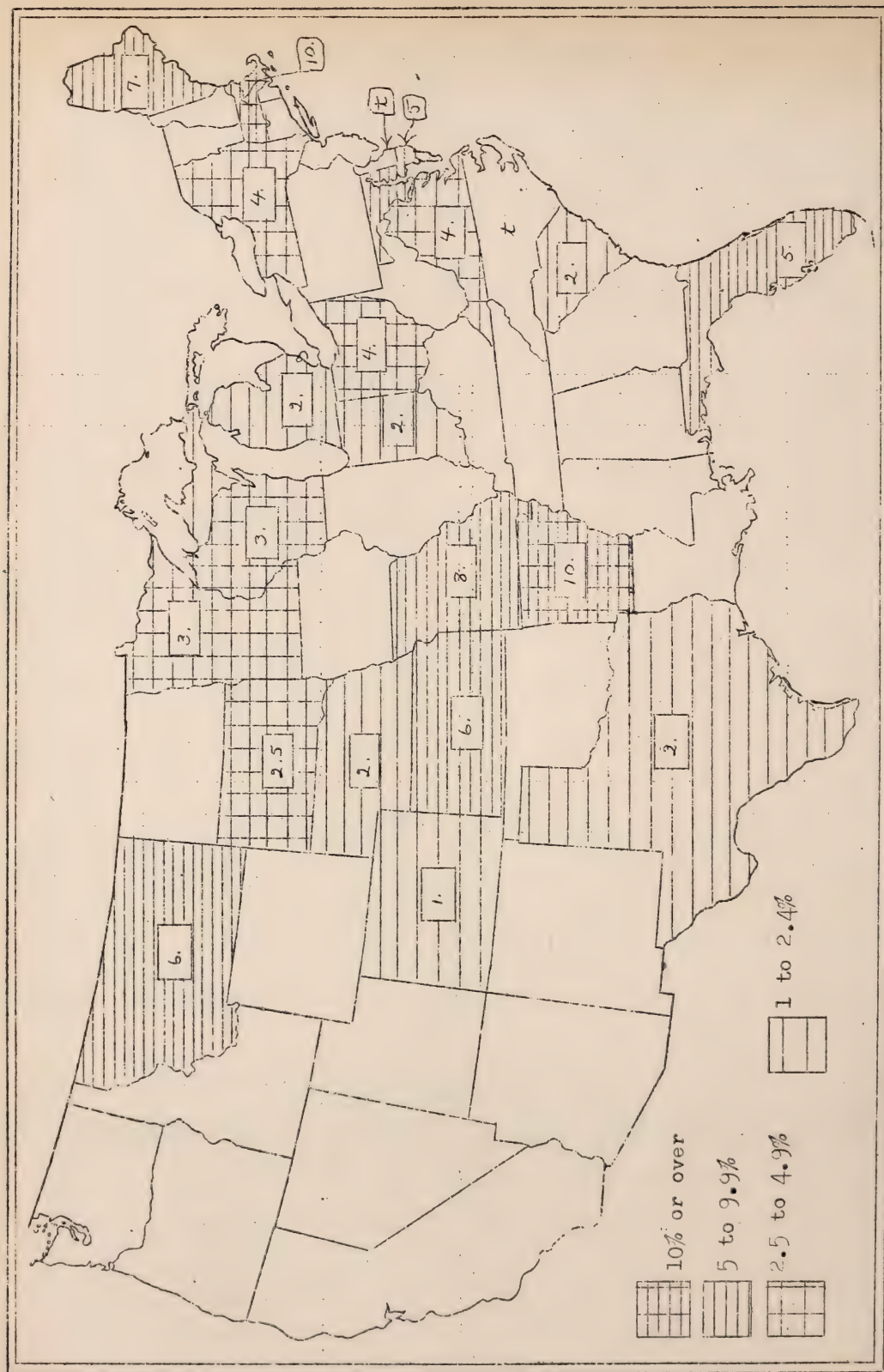


Figure 12. Estimated percentage losses from oat smuts as reported by collaborators, 1930.



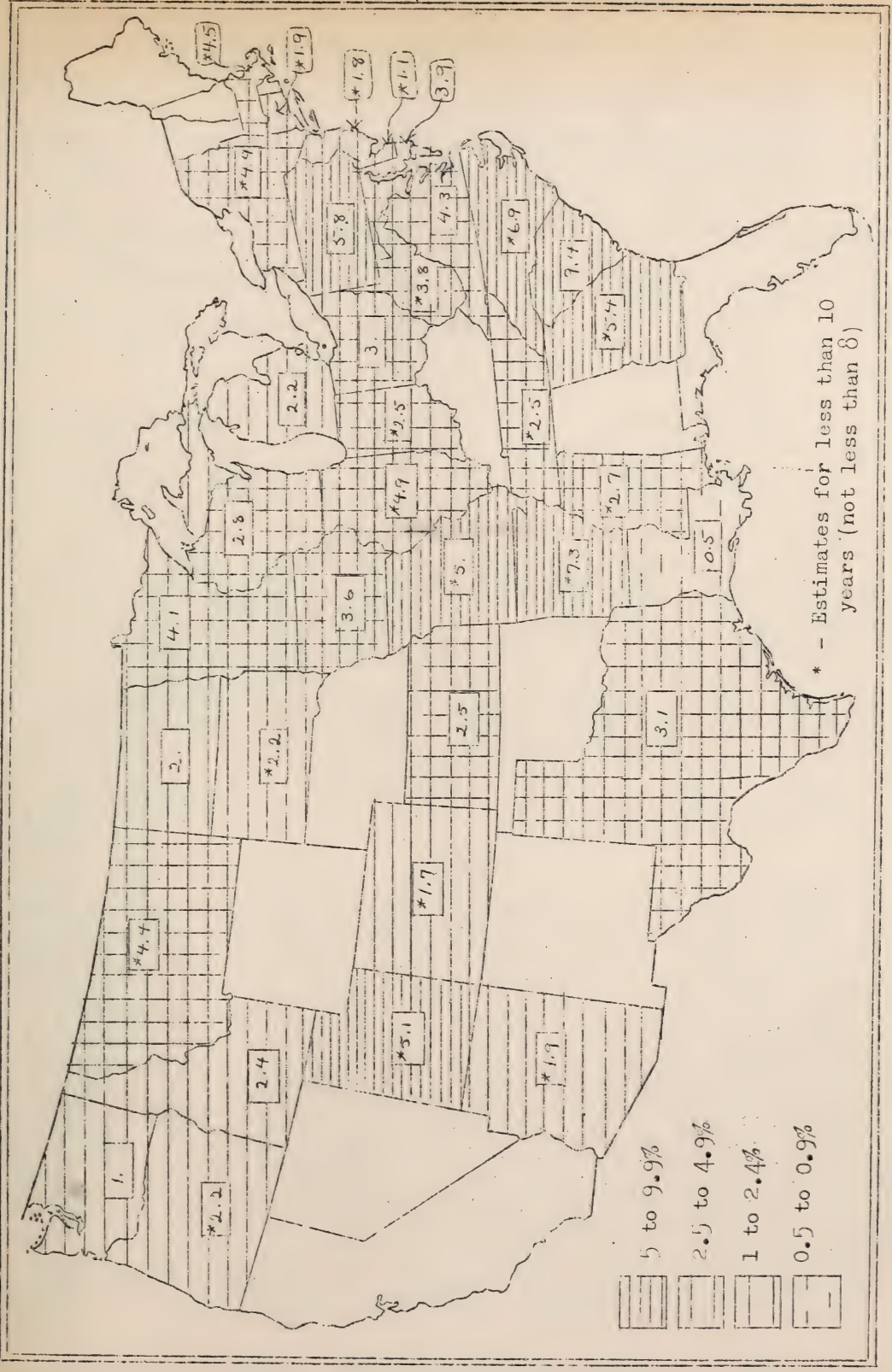


Figure 13. Percentage losses from oat smuts for the period 1920 to 1929.

CROWN RUST (Puccinia coronata).

Table 26. Losses from crown rust of oats as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
30	Florida	3.5	Maryland, Missouri
3	Georgia	0.3	Wisconsin
2	Maine, Texas	Trace	Massachusetts, Connecticut
1	Virginia, Kansas		Delaware, Michigan,
			Minnesota, South Dakota
			Nebraska, Arkansas

HALO BLIGHT (Bacterium coronafaciens) was very severe on certain varieties in experimental plantings at Manhattan, Kansas. At Bonners Ferry, Idaho, the variety Garton was badly infected, the stand being reduced materially. It was found only on this variety.

BLAST (Undet.) was severe in Kansas where it caused a loss of 5 per cent. The variety Kanota, which is usually rather free from blast, often showed considerable amounts in 1930.

CRINKLE JOINT (Undet.) was reported on oats from Nebraska.

C O R N

SMUT (Ustilago zeae) occurred in about the normal amounts or more as shown in Figures 14 and 15. Dry hot weather in New York seemed to favor the disease. In West Virginia, one of the States worst affected by the drought, smut was much more prevalent than usual. C. R. Orton reported that "Corn smut was severe in the State, not being adversely affected by the drought at least in the mountainous sections." Smut was more prevalent in the drier parts of Minnesota than in sections with heavy rainfall. It was also more important in central and western Kansas than in the more humid areas of the State. On the other hand, in Georgia there was more than usual but it developed mostly before the drought started. In Texas it became noticeable only after the severe drought of the early part of the season was broken. The disease was said to be increasing in severity in many of the sweet corn growing sections of New Jersey. New York and Minnesota also mentioned it as being most destructive to sweet corn. In Minnesota it has been found that any fertilizer inducing greater vegetative growth results also in more smut. Phosphate fertilizers in general give much less smut. Losses caused by smut are shown in Table 27.

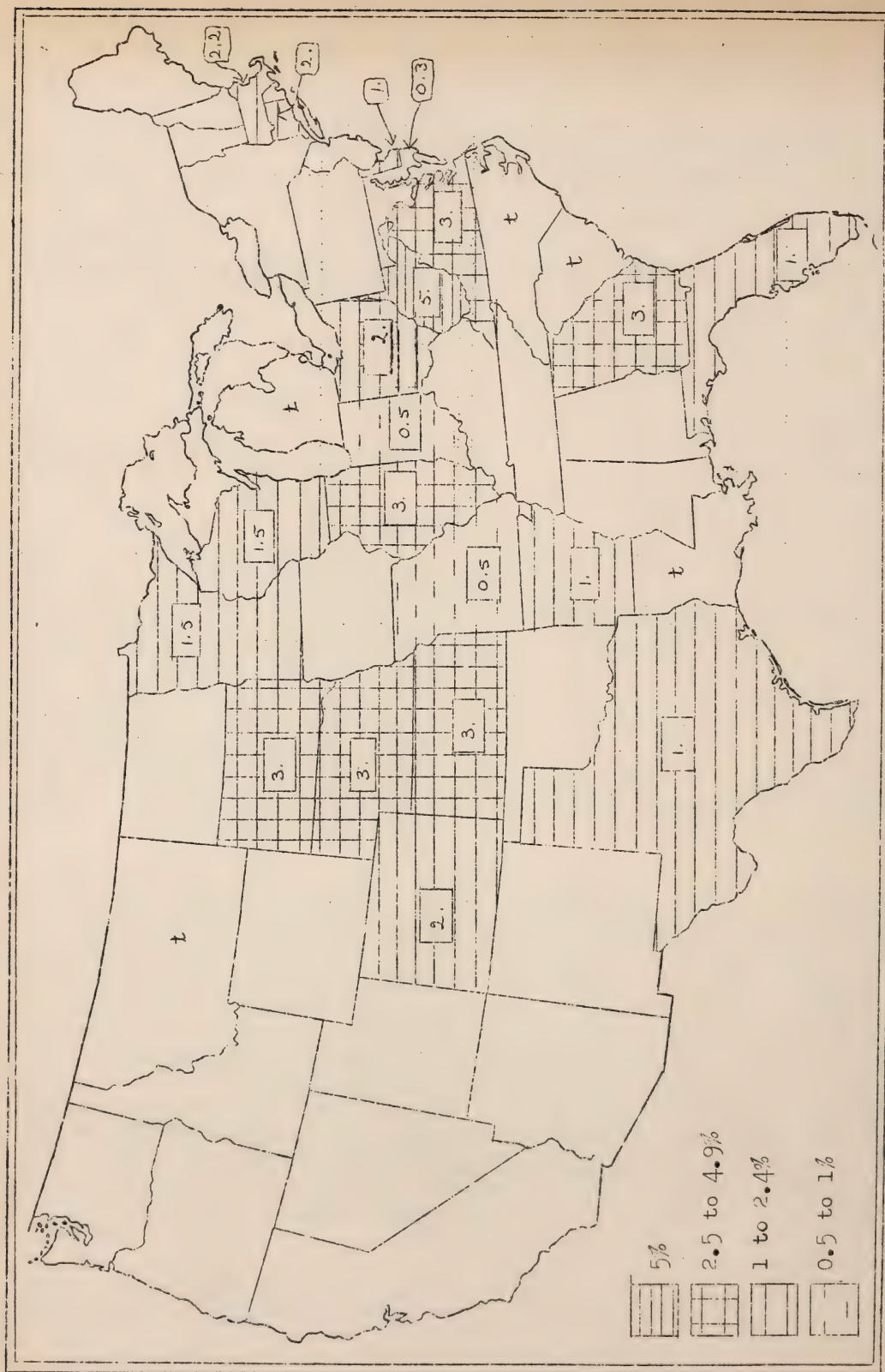
Table 27. Losses from corn smut as estimated by collaborators, 1930.

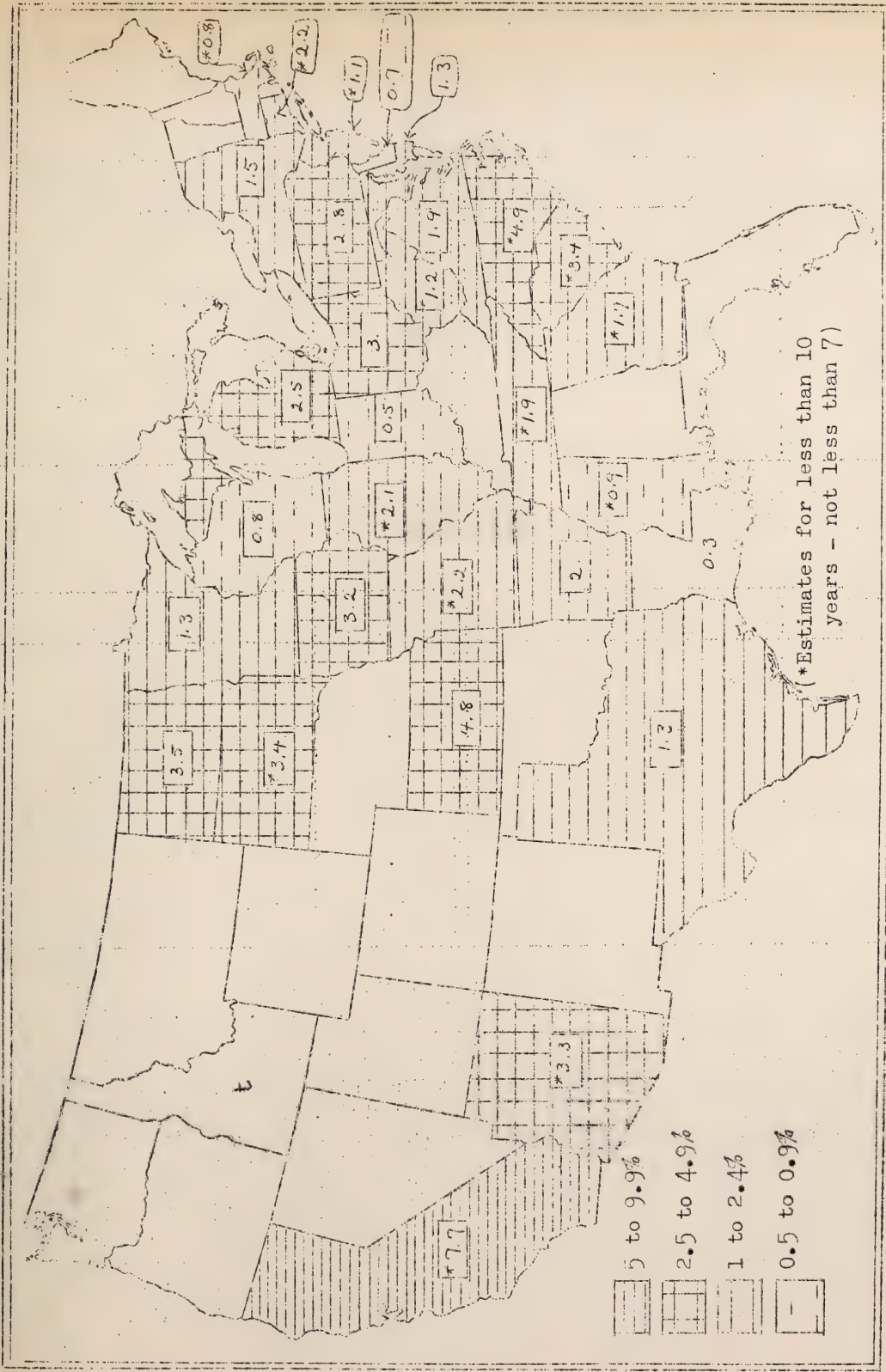
Percentage:		Percentage:	
loss	States reporting	loss	States reporting
5	West Virginia	1.5	Wisconsin, Minnesota
3 to 4	Minnesota (sweet corn)	1.	Delaware, Florida, Arkansas, Texas
3	Virginia, Georgia, Illinois, South Dakota, Nebraska, Georgia	0.5	Indiana, Missouri
2 to 3	New York (sweet corn)	0.3	Maryland
2.2	Massachusetts	Trace	Michigan, North Carolina, South Carolina, Louisiana, Montana
2.	Connecticut		

DRY ROT (*Diplodia zeae*). Losses due to dry rot were reported as 5 per cent in Florida, 4 per cent in Indiana, 1.25 per cent in Missouri, 1 per cent in Kansas, and traces in Maryland and South Dakota. Dry rot was more prevalent than usual in Florida and Indiana. In the latter State dry weather permitted spore development and spread of the organism, according to J. F. Frost. Most collaborators, however, reported less than usual due to lack of moisture. In Florida, besides *Diplodia zeae*, *D. macrospora* and *D. frumenti* are also present, but most of the damage was caused by *D. zeae*. Early planted and early maturing strains were said to be susceptible in Indiana, while late maturing strains were very resistant.

ROOT ROTS AND EAR ROTS (caused by various fungi). *Gibberella saubinetii*, *Fusarium moniliforme*, *Fusarium* spp., and *Pythium* spp. were reported as associated with root and stalk rot and seedling blight. Less damage than usual was reported in most sections. However, L. E. Melchers reported that because of the severe drought it was impossible to determine the actual prevalence of root rot in Kansas. This may have been the case in other States also. Injury was said to be most severe to sweet corn in New Jersey, Delaware and Minnesota. In Minnesota the root rot of sweet corn occurs largely in spots which usually show potassium deficiency. When potash fertilizers are applied less root rot develops. North Carolina also reported successful control of the stalk, root and ear rot due to *Fusarium moniliforme* by the use of potash fertilizers. Losses reported are listed in Tables 28 and 29. The estimates for ear rot include losses from *Diplodia zeae*.







(\*Estimates for less than 10 years - not less than 7)

Figure 15. Percentage losses from corn smut for the period 1920 to 1929.

Table 28. Losses from root rot as estimated by collaborators, 1930.

Percentage: loss	:	States reporting	::	Percentage: loss	:	States reporting
7	:	Maryland	::	1.5	:	Indiana
5	:	Florida	::	1	:	Delaware, South Carolina
3	:	Kansas, Virginia	::	0.5	:	Wisconsin, South Dakota
2	:	Texas	::	Trace	:	Michigan, Missouri, Nebraska

Table 29. Losses from ear rot as estimated by collaborators, 1930.

Percentage: loss	:	States reporting	::	Percentage: loss	:	States reporting
8	:	Texas	::	2	:	Maryland
6	:	Louisiana	::	1.25	:	Missouri
5	:	Florida, South Carolina	::	1	:	Delaware, Georgia, Kansas, Nebraska
4	:	Indiana	::	0.5	:	South Dakota
3	:	Virginia	::	0.1	:	Wisconsin

BACTERIAL WILT (*Aphanobacter stewartii*) was reported from New Jersey, Pennsylvania, Maryland, West Virginia, Texas, Ohio, Indiana, Michigan, Missouri, and for the first time from California where it occurred on Golden Bantam in a garden in San Diego County. It was much more prevalent than usual in West Virginia and Indiana, the losses reported being 2 to 3 per cent in West Virginia, and 1 per cent on susceptible varieties in Indiana. As much as 8 per cent infection was observed in the latter State. In West Virginia observations indicated that the disease was seed-borne. Some fields in New Jersey showed severe injury but in general there was much less than in 1929. There seemed to be a correlation between flea-bettle injury and bacterial wilt in that State. As usual Golden Bantam was generally reported to be very susceptible. Other very susceptible varieties mentioned were Aristocrat, Golden Sugar, and White Cob Cory in West Virginia. Evergreen, Narrow Grain, and Country Gentlemen were said to be immune in Indiana.



BACTERIAL STALK ROT (Bacterium dissolvens) was reported for the first time from West Virginia where it caused even greater damage to sweet corn than the bacterial wilt. The total loss for the State was 5 per cent, but some fields showed complete infection. Apparently this organism also is seed-borne. The varieties Golden Acre, Golden Sunshine, Golden Bantam, Make Good, and Primo Extra Early were very susceptible (C. R. Orton and E. C. Sherwood). In Arkansas extreme drought probably reduced this disease in 1930 to a point where it was not reported for the first time in about eleven years (H. C. Rosen).

BROWN SPOT (Physoderma zeae-maydis) was reported from North and South Carolina, Georgia, Florida, Louisiana, and Arkansas. In Georgia it was found in every field examined but in smaller amounts than usual. Loss estimates are 3 per cent in Florida, 1.5 per cent in Georgia, and a trace in Arkansas.

LEAF BLIGHT (Helminthosporium turcicum) was reported from Massachusetts and Florida. In Florida it was very severe on all varieties grown on the Experiment Farm. It appeared late and in some cases caused premature death. In one field observed in Massachusetts, one-half which was planted to dent corn was free, while the other half in Golden Bantam was infected. Stowell's Evergreen was also said to be susceptible in Massachusetts. Helminthosporium sp. was abundant on leaves of corn in the drought area of North Carolina.

LEAF SPOT (Ophiobolus heterostrophus) was not as common and destructive in Florida as the Helminthosporium leaf blight but was nevertheless prevalent.

ROOT KNOT (Cacconema radicum). Field corn grown on infected soil near Cameron, North Carolina, was attacked and some plants were stunted, probably from the infection (R. F. Poole).

MOSAIC (virus) was less prevalent than usual in Louisiana. The highest infection observed in the field was 5 per cent. This disease is scattered in distribution and is usually of only slight importance (E. C. Tims).

DROUGHT INJURY. A number of collaborators estimated the loss due to drought. These are: Kentucky and Arkansas 60 per cent, Delaware 15 per cent, South Dakota 14 per cent. Valleau in Kentucky reported that "All of the corn on the Experiment Station farm was cut soon after blooming as it failed nearly completely to set a crop. Seed corn will be very scarce over the State because of the drought. The plants made excellent growth but at blooming time the top leaves and tassels turned white and appeared scorched."

## DISEASES OF FORAGE CROPS

### ALFALFA

Bacterial Wilt (Aplanobacter insidiosum). In 1930, it was reported from Massachusetts and from Wyoming for the first time, although there was evidence that it had been present in both States for several years. In Massachusetts it was found to occur in all the seven counties surveyed. Injury varied in amount from a trace in young fields to from 50 to 90 per cent in older plantings or in young stands reseeded after previous alfalfa crops. The total loss was estimated at 5 per cent. The disease is beginning to cause concern in western Ohio. In Illinois wilt was more important than usual. It was present in most two-year old and in all three-year old fields examined, and contributes to the death of the field after the second year. In Wisconsin wilt was much less prevalent than usual. In Kansas this disease was said to be the chief factor in the reduction of approximately 150,000 acres from the area planted to alfalfa ten years ago. The results of an extensive survey of the important irrigated alfalfa sections of Wyoming showed that bacterial wilt is widespread and very destructive. The annual loss from the disease probably reaches 15 to 20 per cent of the entire crop, considering the number of fields affected, the percentage of infection in the fields, and the loss due to ploughing up poor stands earlier than would otherwise be necessary. Wilt has been on the increase in southern Idaho for several years and has eliminated all of the older stands from the western part of Twin Falls County along the Snake River Valley to the Oregon line. In 1930, however, it was not as prevalent or as severe as previously and field observation indicated that the severe damage of the last four or five years was associated with winter injury. Wilt occurred wherever alfalfa was grown in Colorado. In California the disease is restricted in distribution. There was more than usual in 1930.

An interesting feature with regard to this disease was the report by F. R. Jones of his isolation of an identical or very closely similar organism from roots of alfalfa collected in Turkestan by Westover in November, 1929. Inoculations with this organism produced typical disease symptoms in the greenhouse. (P. D. R. 14: 125) (P. D. R. 14: 56, 9, 125, 200, 224, 225).

Yellow Leaf Blotch (Pyrenopeziza medicaginis) is the most common and widespread leaf spot of alfalfa in Kansas. The loss in 1930 was estimated at 5 per cent.

Bacterial Blight (Bacterium medicaginis) was observed in North Carolina this year for the first time. It was found on plants from the test farm at Statesville. (R. F. Poole).

Leaf Spot (Pleosphaerulina briosiana). Rather heavy infection in Georgia in April, about 10 per cent of the leaves, which is unusual. (J. H. Miller).

Root Rot (Phytnatotrimum omnivorum) was severe as usual in Cameron and Hidalgo Counties in Texas. The loss was estimated at 10 per cent.

Rust (Uromyces medicaginis). A general epiphytotic occurred throughout the southern two-thirds of Illinois in the fall, dwarfing growth severely. (L. R. Tehon). Also reported from Texas.

Winter injury caused losses reported at 7 per cent in Missouri, 4 per cent Texas, and 3 per cent in South Dakota. Damage from freezing was reported also from Arkansas, Wisconsin, Nevada, and Washington.

Albinism (probably genetic) was again reported from Montana. A new feature was its observation on the second crop. (P. D. R. 14:225).

Fasciation (undet.) This abnormality does not seem to be common on alfalfa. The first report to the Survey was from Montana in 1930. (P. D. R. 14:182).

#### C L O V E R

Powdery mildew (Erysiphe polygoni) was rather generally reported as less prevalent than usual. In Missouri less was observed than had been seen for the past eleven years, probably due in part to the drought and the hot summer. Some fields in New Jersey showed severe infection. In North Carolina the disease was very abundant on red and alsike clover.

Leaf spot (Cercospora medicaginis). A specimen of crimson clover affected by this fungus was received from Tennessee. This seems to be the first report from the State.

#### S W E E T C L O V E R

Stem rot (Corticium vasum) affected 75 per cent of the plants in one field of yellow sweet clover in Montana. A 50 per cent infection was observed in a field of yellow sweet clover in Massachusetts, but it appeared too late to cause much loss. Also reported from North Carolina on white sweet clover. (P. D. R. 14:125).

Bacterial wilt (undet.) occurred on yellow and white sweet clover in Ohio. (P. D. R. 14:115).

Wilt (undet.) Kentucky. (P. D. R. 14:115).

Ring spot (virus of tobacco ring spot). About 30 per cent of the plants severely affected in a quarter-acre field of white sweet clover in Montana. This is the first report of ring spot on sweet clover to the Survey. (P. D. R. 14:125).



## C O W P E A

Blight (Botrytis sp.). New Jersey. This is the first report to the Survey of Botrytis on cowpeas.

Wilt (Fusarium sp.) was general in Virginia and caused the death of about 2 per cent of the plants. F. tracheiphilum was reported from Texas.

## S O Y B E A N

Bacterial Blight (Bacterium sojae) was reported from Massachusetts for the first time. It was observed in a seed source plot on a farm in Franklin County, and in the variety plots on the college farm, Amherst.

Wilt (Sclerotium rolfsii) was severe in Virginia where it caused a loss of 10 per cent. Greatest damage occurred shortly after a heavy rain that followed a drought. It was also reported from Louisiana.

## V E T C H (Vicia spp.)

Leaf spot (Pleosphaerulina briosiana) was reported from Georgia on Vicia monantha, which seems to be a new host for the fungus.

Downy mildew (Peronospora viciae) occurred in agronomy plots at Athens, Georgia, on a hybrid between Vicia angustifolia and V. villosa. The hybrid was just covered with downy mildew while the other varieties were not touched. This is rather interesting because the mildew is rather common on the wild V. angustifolia but very rare on V. villosa, and the cross is infected much worse than either parent. (J. H. Miller).

## D I S E A S E S O F F R U I T A N D N U T C R O P S

### A P P L E

Scab (Venturia inaequalis). This disease was generally somewhat less severe than in 1929. In most Northeastern States and in Michigan, Indiana, Nebraska, and Kansas, it was equally as prevalent or more so than usual but in the Middle Atlantic and most Mid-Western States, where apples are grown at all commercially, and in California, the disease was less or much less prevalent than in 1929. In New York and New England unsprayed fruit of susceptible varieties became very badly affected with scab due to the general infection of the leaves during the spring when the weather was favorable for the early maturity, discharge, and germination of the ascospores and periods of rainy weather favorable for infection. Even the hot dry weather of summer did not prevent the

development of scab on the fruit in the extreme Northeast. However, good spraying protected even susceptible varieties very satisfactorily under the prevailing weather conditions. South of Pennsylvania and New Jersey the drought, which began rather early in the spring and continued with increasing severity prevented scab infection generally. This is well shown in Figures 16 and 17.

Observations on the development of ascospores were made in twelve States and eight of these reported an earlier development than has occurred for from two to several years. (P. D. R. 53-57, 62, 66, 73-74, 83-84).

Table 30. Losses from apple scab as estimated by collaborators, 1930.

Percentage:		Percentage :	
loss :	States reporting	loss :	States reporting
29 :	Maine	2 :	Connecticut, Maryland,
15 :	Pennsylvania	2 :	North Carolina,
12 :	Wisconsin	2 to 3.5 :	Minnesota, Missouri
10 :	New Jersey	1 :	Illinois
5 to 10 :	New York	1 :	Delaware, Georgia,
5 :	Massachusetts,	0.5 :	Ohio, South Dakota
5 :	Michigan	Trace :	Virginia
3 :	Indiana	Trace :	Kentucky, Arkansas,
:		:	Montana, Nebraska
:		:	

See also P. D. R. 14: 85, 106-107, 116, 126-127, 156, 172, 215, 226.

Blotch (*Phyllosticta solitaria*). Blotch was less prevalent throughout the country than usual. Delaware is the only state reporting more than usual and there the loss was slight. Apparently dry weather held it in check although the high temperature that prevailed during the summer was favorable for its development. Nevertheless, as high as an 80 per cent infection is reported from one orchard in Virginia and a 25 per cent infection from one in West Virginia. The spray program kept the disease under control in commercial orchards. P. D. R. 14:126.

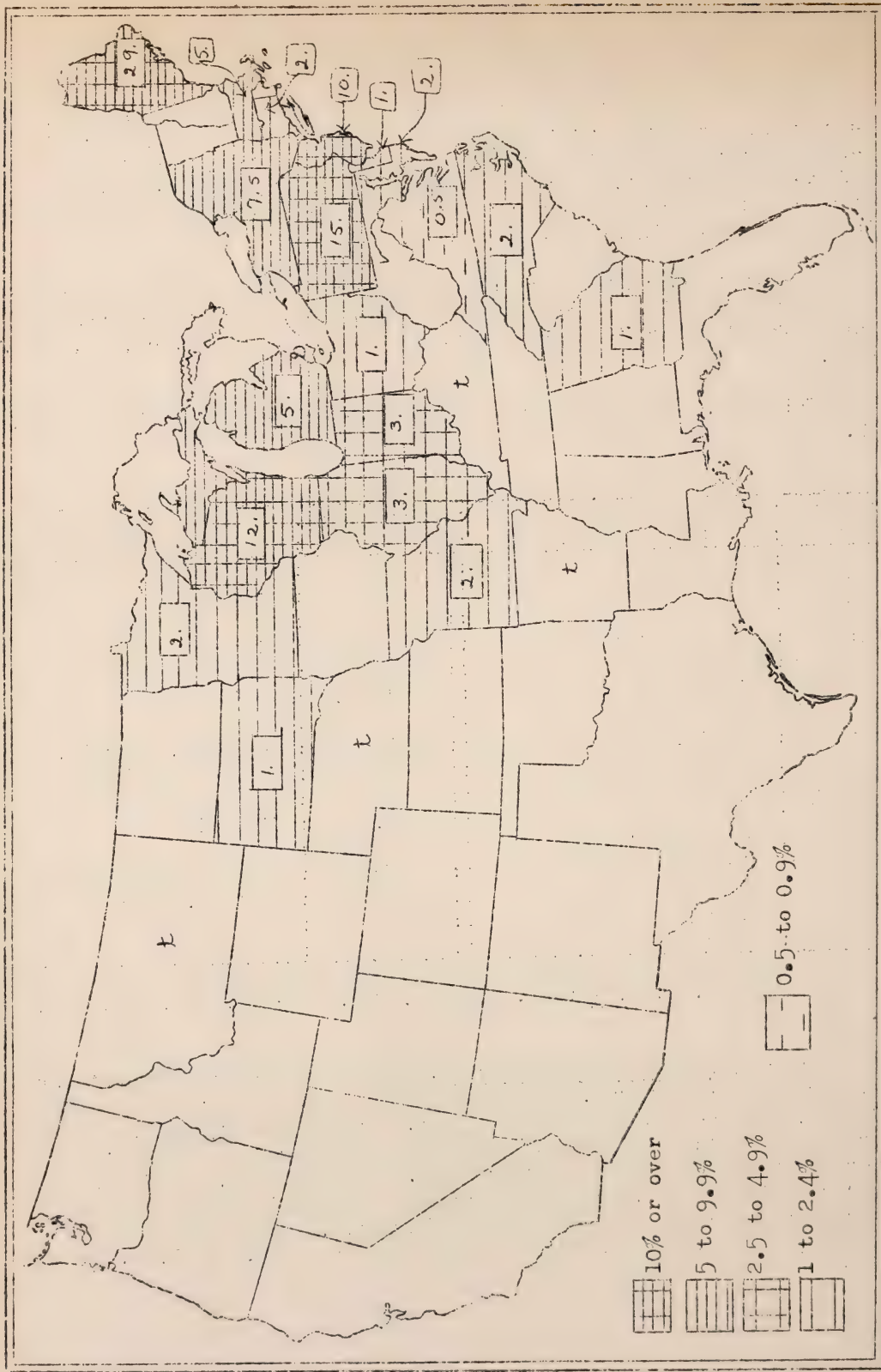


Figure 16. Percentage losses from apple scab in 1930 as estimated by collaborators.



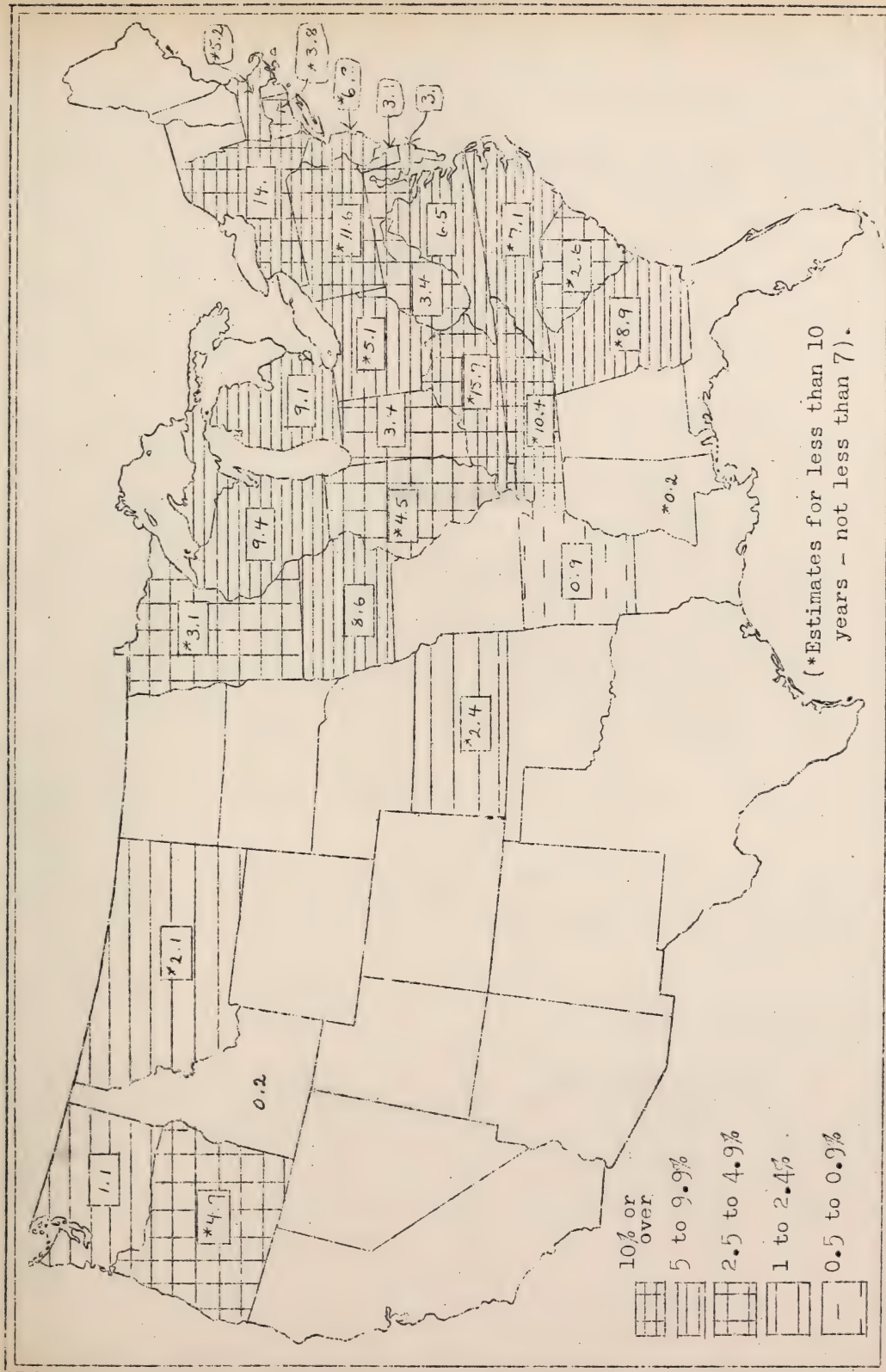


Table 31. Losses from blotch of apples as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
5	Illinois	0.1	Georgia, Ohio, Indiana
3	Kansas, North Carolina	Trace	Massachusetts, New Jersey, Virginia, West
2	Missouri		Virginia, South Carolina,
1 to 2	Texas		Kentucky, Michigan,
0.5	Delaware, Maryland		Wisconsin, Minnesota,
			South Dakota.

Apple Rust (*Gymnosporangium juniperi-virginianae*). Favorable spring weather permitted the exudation of the telial horns so that the rust on the leaves, and in some cases on the fruits, of susceptible apples was as prevalent as usual. New Jersey, Delaware, and South Dakota report greater prevalence while the South Atlantic States report less than usual and Arkansas much less. Infections were general and heavy in Alabama with red cedars usually nearby. New York reports greater severity locally of the rust diseases than in 1929 but considerably less than in 1927 and 1928. The loss, in general, was small, due very likely to the dry weather which later prevailed. P. D. R. 107, 126, 156, 184, 214-215.

Table 32. Losses from rust of apple as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
5	Minnesota	0.5	Connecticut, New Jersey,
4	South Dakota	0.1	Maryland, Arkansas
2	Massachusetts, North Carolina, Missouri	Trace	Georgia
1	Nebraska		Maine, Delaware, Virginia,
0-1	New York		West Virginia, Michigan,
			Wisconsin

Quince Rust (Gymnosporangium *germinale*). This rust is reported from New York as being more prevalent on apple fruit than apple rust but not severe. See P. D. R. 14: 214 for a discussion of affected varieties and prevalence in that State. It was said to be less prevalent than last year in Indiana where it usually is of only moderate importance. It occurs in the Piedmont area of North Carolina but causes much greater injury to cedars than to apples.

Hawthorn Rust (Gymnosporangium *globosum*). New York reports this rust as being rather generally prevalent in the eastern part of the State but slight on most apple varieties. See P. D. R. 14: 214-215 for list of affected varieties. Mississippi reports it as occurring on apples in Lauderdale County.

Black Rot (Physalospora *malorum*). Of the twenty-two States reporting this disease, Virginia, North Carolina, Georgia, Arkansas, Indiana, Wisconsin, and Missouri indicate that it was less or much less prevalent than usual, while eleven other States indicate that it was of equal or greater prevalence. In only one State was the loss reported to be greater than one per cent and in most States it was less. In Delaware the heaviest outbreak on fruit ever observed occurred although the total loss was small. Greater loss was caused by defoliation than by fruit rot in Georgia. In Alabama black rot was common in most orchards on leaves near old branches blighted by Bacillus *amylovorus* in which the fungus overwintered. It was general in Kansas on leaves of even well sprayed orchards but not prevalent on fruit.

Table 33. Losses from black rot of apples as estimated by collaborators, 1930.

Percentage:			Percentage:		
loss	:	States reporting	loss	:	States reporting
5	:	Maryland	0.1	:	Georgia, Ohio
1	:	Connecticut, Virginia,	Trace	:	Massachusetts, New Jersey,
	:	South Carolina,		:	North Carolina, Arkansas,
	:	Minnesota, Missouri		:	Illinois, Michigan,
	:			:	Wisconsin, South Dakota,
0.5	:	Delaware, Texas		:	Nebraska
	:			:	

Also reported from New Hampshire, Kentucky and Nebraska. P. D. R.



Bitter Rot (*Glomerella cingulata*). This disease, usually of slight or moderate importance, was even less prevalent this year. Delaware and South Carolina were the only States in which it was as prevalent as in 1929, while in all the other States reporting on its occurrence, it was less or much less prevalent, or not seen at all. The losses reported are: South Carolina 5 per cent, Maryland and Missouri one per cent and the other States 0.1 per cent or a trace. P. D. R. 126, 156, 172.

Blight (*Bacillus amylovorus*). This disease, for the past few years of slight or moderate importance in most States, was unusually prevalent during 1929 and 1930. During the latter year it was even more important than in 1929, except in Massachusetts, Mississippi, and Minnesota where it was less. It was very severe in Central and Eastern New York. In Pennsylvania, the collaborator reports a trace to severe infection in every orchard seen. Blossom blight was very prevalent and destructive in many parts of Kentucky. There was a severe and widespread epidemic on various apple varieties in Arkansas where the disease is said to have been more destructive than in any year for which there are records. There is evidence that it was equally prevalent in the Ozarks of Missouri. One Oklahoma grower reported a loss of five hundred dollars in one small orchard. It was present in Washington and was much more prevalent in California than in 1929. Blight, in most localities, first affected the blossoms, in some cases so generally that the crop was reduced or lost entirely. Later twig blight did considerable damage. P. D. R. 85, 107-108, 116-117, 127, 155, 156, 172.

Table 34. Losses from blight of apples as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
15	Georgia	1.5	New Jersey
10	North Carolina, Texas	1	Maryland, Michigan,
5	Arkansas, Missouri	Trace to 1	Wisconsin
2.5	Illinois	0.5	New York
2	Ohio, Indiana, Minnesota	Trace	South Carolina
	South Dakota		Massachusetts, Delaware,
			Montana

BITTER PIT OR STIPPEN. Of the ten States reporting this disease, four, New Jersey, Delaware, Maryland, and North Carolina, indicated that it was more prevalent than in 1929 and one, Wisconsin, that it was less prevalent. Connecticut and North Carolina report it as being unusually common on heavily fruited trees. In Indiana it was serious on Grimes which, this year, had a light crop. There are several reports from Massachusetts of heavy development of bitter pit in storage.

INTERNAL BREAKDOWN. Was reported from Virginia and West Virginia as being much more prevalent than usual especially on Ben Davis and Gano, and appearing late. In Indiana it occurred in the early part of the storage season. Breakdown was also reported from Washington.

DROUGHT SPOT was more prevalent than usual in Delaware where it was very common on Ben Davis. This trouble was also reported from Kentucky and Washington. Two cars of Rhode Island Greening shipped to New York from Vermont showed 50 per cent internal browning and several cars of this variety from New York showed as high as 7 per cent. P. D. R. 15: 16.

WATER CORE. This also appeared to be more prevalent than usual in most of the five States reporting its presence. In Delaware it was very common on early varieties. In Virginia it was observed in severe form on drought-affected Winesap and Stayman Winesap trees as well as on well-watered ones. It was much more prevalent than usual in West Virginia where it caused a loss of 5 per cent of the crop, and 40 per cent affected fruit was observed in one orchard.

WINTER INJURY. Rather severe injury occurred to apple trees in the Midwestern States of Indiana, Illinois, Missouri, and Arkansas, and in Kentucky. Some injury was also reported from Washington. The varieties most affected are Delicious, Stayman Winesap, Jonathan, Grimes Golden, King David, Rome Beauty, and Collins. Ben Davis was injured in some orchards and in others appeared to be resistant. The injury, for the most part, occurred in orchards up to ten years of age and especially in those in which late growth had been stimulated. In one Arkansas orchard pruning just previous to the freeze of January 15 resulted in a large percentage of injured trees. Most of the injury reported consisted in a splitting of the bark of the trunk on the south side, sometimes extending nearly around the tree, and, in some cases, injury to the branches, twigs, and buds was reported. In a young orchard in Indiana, only the trees that blossomed were sprayed and these were the only ones that recovered from the bark injury; the injured ones, not sprayed, whose leaves had been badly scabbed, failed to heal well. A collar rot type of winter injury killed 10 per cent of single-worked Grimes Golden and some double-worked trees in southern Indiana. P. D. R. 49-52, 62-65, 71-73.

Drought: caused a marked reduction in size of fruit in southern New Jersey. In Maryland the loss directly due to drought was estimated at 35 per cent. Fruit drop, premature ripening, poor quality, and greatly reduced yields were results of dry weather in Arkansas where both drought and low winter temperatures caused widespread tree injury. The extent of the injurious effect of the prolonged drought will probably not be fully realized until the spring and summer of 1931.

### P E A R

Blight (*Bacillus amylovorus*). Of twenty-four States reporting this disease was more prevalent than usual in five States, less prevalent in five. It was very common and severe in Pennsylvania and North Carolina, severe in Georgia on standard varieties other than Pineapple, common in most of the old groves in Florida. Severe epidemics were reported from California and eastern Texas. In California 75 per cent of the blossoms were blighted on some trees, and the death of entire trees was common. Trees in remote locations were badly affected. Infection took place about April 15, became evident about April 20, and spread rapidly until by April 28 all parts of the State except two or three localities were involved. In a number of States freezing of the blossoms obscured the effects of blight. In Nebraska the disease was rather serious in the spring. In Michigan serious outbreaks occurred early in the spring but were checked later by the severe drought. This was probably true in other States also. Losses are given in Table 36. P.D. R. 155, 157.

Table 36. Losses from blight of pears as estimated by collaborators 1930.

Percentage:		Percentage:	
loss :	States reporting	loss :	States reporting
18 :	North Carolina	4 :	Maryland
15 :	South Carolina, Florida:	3 :	Michigan
	Texas, California		
10 :	Virginia, Illinois	1.5 :	Delaware
6 :	Missouri	1. :	Massachusetts, Ohio
5 :	Louisiana	.5 :	Connecticut
		Trace :	Kentucky, Wisconsin



Scab (Venturia pyrina). In general, this disease was less prevalent than last year, although in Connecticut and Michigan it was equally as prevalent. A 5 per cent loss in Wisconsin was reported, 2 per cent in Maryland, 0.5 per cent in Connecticut, and a trace in Virginia, North Carolina, Ohio and Michigan. It occurred in New Jersey, Kansas, and Washington. In California it was absent or negligible. Massachusetts reports a 50 per cent infection on the fruit of a few Kieffer pear trees, a variety seldom affected by scab. P. D. R. 117.

Leaf Blight (Fabraea maculata). This disease was reported to be of relatively little importance. In Louisiana three Pineapple pear trees at the Hammond Station were affected so severely that they were almost completely defoliated by the end of June. This is apparently the first time it has been reported in Louisiana. The loss amounted to 5 per cent in Florida, 3 per cent in Delaware and Maryland, 0.5 per cent in Connecticut, traces in other States.

Rust (Gymnosporangium germinale). Texas P. D. R. 14: 182.

Sooty Blotch (Gloeodes pomigena). First report from Connecticut to the survey. This disease is not very commonly reported on pears.

Black Rot (Physalospora malorum). North Carolina, Florida, California. P. D. R. 201.

WINTER INJURY (Non-parasitic). Washington, severe. P. D. R. 14: 172.

Root and Crown Rot (Undet.) occurs locally in Washington, St. Tammany, and Tangipahoa Parishes in Louisiana. This disease is either a new one for Louisiana or it has become more noticeable because of the increased planting of pears in recent years. It was brought to the attention of this Department two years ago from Covington. (A. G. Plakidas).

#### Q U I N C E

Blight (Bacillus amylovorus). More prevalent than usual in the States reporting, New Jersey, Pennsylvania, Delaware and Texas, P. D. R. 127.

#### P E A C H

Brown Rot (Sclerotinia<sup>r</sup> fructicola). The reduction in the amount of brown rot from 1929 is shown by the fact that in 1929 eleven States, and in 1930 only two, reported losses of 5 per cent or over. The situation with respect to the average year is indicated by Figures 18 and 19. Blossom blight killed 100 per cent of the blossoms of some varieties in Cumberland County, New Jersey, and there was also a heavy loss in Cape May County. In Delaware twig infection was observed to be very common as early

as May 7. In California the disease was more prevalent than usual and ripe fruit rot in orchards where no fruit was picked may become a factor next season. In the Middle West, as a result of winter killing, there was little if any fruit to be affected. (P.D.R. 117, 156).

Table 37. Losses from brown rot of peaches as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
12	Massachusetts	2	Ohio
5	North Carolina	1	Connecticut, Illinois.
4	Florida	0.5	Delaware, Georgia, Texas
3	New Jersey, Maryland	Trace	Virginia, Arkansas, New York, Michigan.
	South Carolina		

Leaf Curl (Exoascus deformans). The only State reporting a loss greater than one per cent was Ohio with 3 per cent. In Indiana there was said to be less leaf curl than in any other season during the past five years. In Arkansas it was almost entirely absent.

Scab (Cladosporium carpophilum). P. D. R. 156.

Table 38. Losses from peach scab as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	Florida	0.5	Connecticut, New Jersey, Delaware, Ohio, Missouri
4	Texas	0.1	Georgia
2	South Carolina	Trace	Massachusetts, New York, Virginia, Arkansas,
1	Maryland		Wisconsin

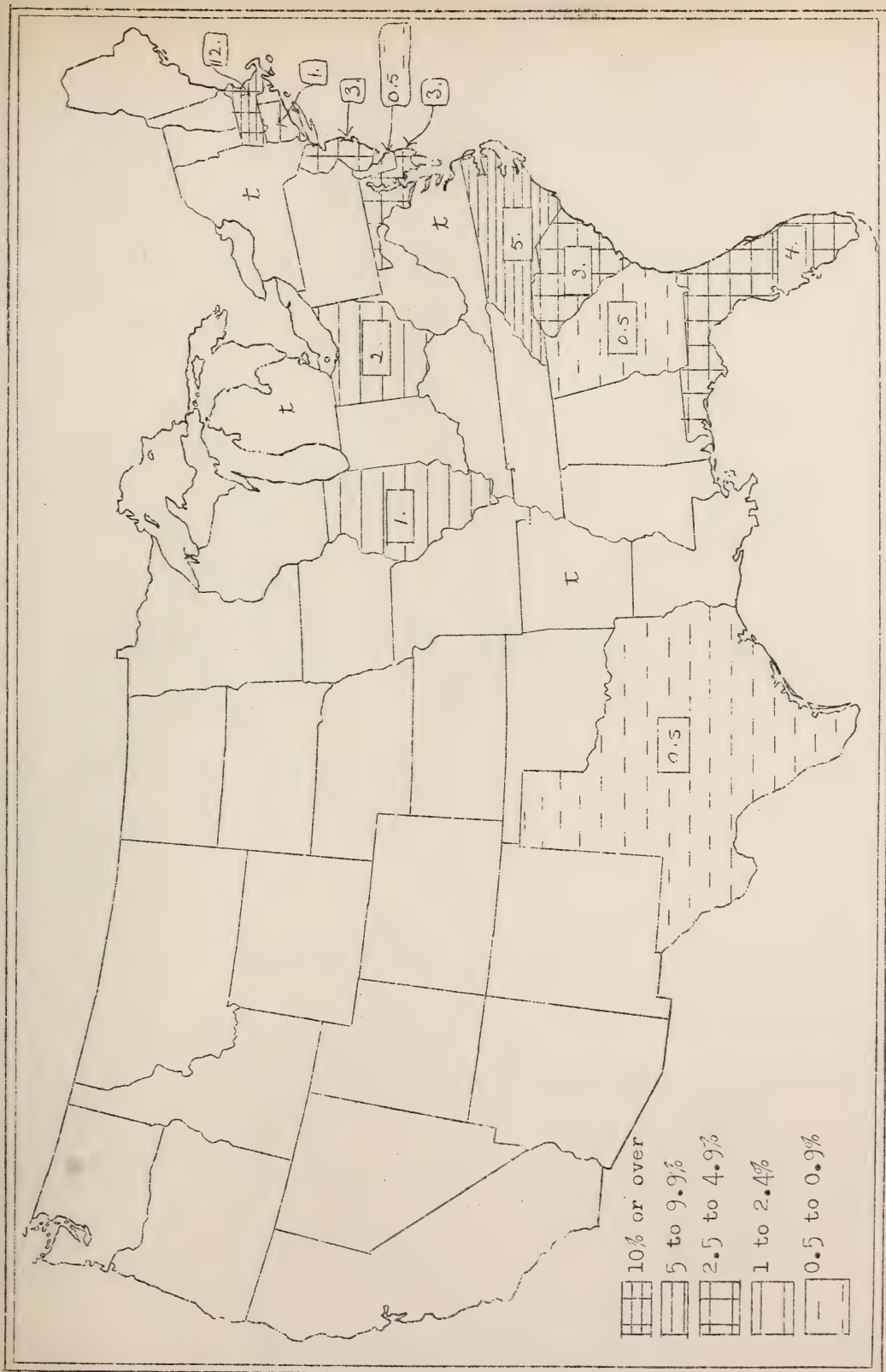


Figure 18. Percentage losses from brown rot of peaches as estimated by collaborators - 1930.





Bacterial Spot (Bacterium pruni) was less or much less prevalent than usual in practically all States reporting. Leaf spot associated with definite cankers containing viable bacteria was found in three localities in southern Illinois on April 25, the earliest record of occurrence in that State. According to Anderson, there seems to be some relation between the cankers and winter injury. Cankers associated with leaf infection were reported from Kentucky also. Poole reported that in North Carolina fruit infection was heaviest on the most vigorous trees. The only losses reported as 1 per cent or more were 2 per cent in South Carolina, 1.5 per cent in Maryland, 1 per cent in New Jersey. P. D. R. 86, 156.

Yellows (Virus). Ten States reported this disease as present but the loss was only a trace to about 0.8 per cent except in North Carolina where a 2 per cent loss was indicated. It was very severe in Huntington County, New Jersey where the increase since 1929 varied from 5 to 40 per cent. It has been gradually decreasing in Pennsylvania since 1921 when there was 4.45 per cent of affected trees. In 1930 only 0.07 per cent of the trees inspected were affected. P.D.R. 172, 213.

Rosette (Virus). P. D. R. 149.

Phony Disease (Virus). The known range of phony disease was considerably extended during 1930. Besides Georgia, Alabama and Mississippi, the disease was found to occur in North and South Carolina, Tennessee, Louisiana, Arkansas, and Texas. P. D. R. 148-149, 171.

Crown Gall (Bacterium tumefaciens) is more prevalent on the peach than was supposed in North Carolina. Trees being removed from lands in the Sand Hills show many galls at the base of the trunk and on the roots. Some of the galls have reached six to ten inches in diameter. Many of the trees have been weak for several years, bearing inferior, prematured peaches. (R. F. Poole).

Black Rot (Physalospora malorum). Abundant on dead twigs in orchards in the Sand Hill area of North Carolina.

Root Rot (Armillaria mellea) killed more trees this year in North Carolina than during the two previous seasons.

Bitter Rot (Glomerella cingulata) New Jersey, severe on fruit grown in greenhouse.

Fruit Rot (Botrytis cinerea). Occasionally found on fallen fruit in North Carolina.

Rust (*Tranzschelia punctata*) has not occurred in the Sutter-Yuba peach area for the last two years. It has been present but unimportant in other peach districts in California. (Scott and Stout).

WINTER INJURY: Very severe injury to trees and loss of crop was reported from many States, especially in the Midwest, as a result of low temperature during the winter, particularly the freezes of January. These reports are given in P.D.R. 14: 24-27, 44-49, 52, 62-65, 108. Massachusetts and Connecticut report no loss although some buds were killed. In Delaware, the commercial crop in Sussex County was lost and in Kent County there was about a 70 per cent loss. In West Virginia the crop was very light as a result of below zero temperatures on morning of February 18. Washington also reports winter injury.

DROUGHT INJURY: Massachusetts reports a case of transparant spots in the flesh of fruit as a result of drought.

SPRAY INJURY: Severe defoliation and bark injury occurred in some Massachusetts orchards as a result of the first summer sprays or dusts, not in commercial orchards, however. This also occurred commonly in Connecticut and New Jersey where arsenate of lead in either dust or spray was used. A loss of 2.5 per cent of the crop was reported from Maryland and, in Virginia, arsenical injury to the foliage was quite general in most peach orchards. P.D. R. 156.

#### P L U M and P R U N E

Brown Rot (*Sclerotinia fructicola*).

Table 39. Losses from brown rot of plum as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	: Massachusetts, Florida	2.5	: Maryland
8	: South Carolina	1	: Connecticut
5	: North Carolina,	0.5	: Delaware
	: Illinois		: Minnesota
3	: Indiana, Michigan	Trace-10	: Virginia, Arkansas
	: Wisconsin	Trace	



Bacterial Spot (Bacterium pruni). About as prevalent as usual except in Arkansas where it was much less so. Only a trace to 1 per cent loss was reported. In North Carolina heavy infection on susceptible varieties during the past three years has resulted in ragged trees.

Shot Hole (Cercospora circumsclissa). Connecticut. P.D.R. 201.

Leaf Gall (Exoascus mirabilis). Mississippi.

Rough Bark (over-nutrition) on prune. Washington. P.D.R. 172.

DROUGHT INJURY: Tipburn on prune, Louisiana; Gum Pocket and Fruit Necrosis, Washington.

WINTER INJURY: Arkansas, New Mexico. P.D.R. 65.

### C H E R R Y

Brown Rot (Sclerotinia fructicola). About equal in importance to previous years in most States reporting. In Wayne County, New York, many sweet cherry blossoms were killed, causing a material reduction in the crop. Sour cherries were less affected there and throughout the Ontario belt. There was a severe infection on small plantings in Bergen County, New Jersey. A small amount of fruit rot occurred in all the States reporting. P. D. R. 106.

Table 40. Losses from brown rot of cherry as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
5	New York	0.5	Michigan
2	Minnesota	Trace	Massachusetts, Delaware,
1	Connecticut, Maryland		Arkansas, South Dakota,
	Wisconsin		

Leaf Spot (Coccomyces hiemalis) P.D.R. 172.

Table 41. Losses from leaf spot of cherry as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
5	Minnesota	1	North Carolina, Ohio, Wisconsin
3	Michigan, Missouri	0.5	Connecticut, Delaware
2	Maryland, South Dakota	Trace	New York, Kentucky, Arkansas, Nebraska

Fusarium Blight (*Fusarium* sp.) Washington. This is the first report of this trouble to the Survey.

Root Rot (*Phymatotrichum omnivorum*). Texas. First report from State on this host.

Winter Injury: Kentucky, Utah, Washington. P. D. R. 63, 65, 86, 172.

#### APRICOT

Blight (*Coryneum beijerinckii*) was more important than usual on this host in California. Following unusual late rains, the fruit spot caused heavy loss in some unsprayed groves in the Hemet district, according to Horne. A loss of 5 per cent was estimated by Scott and Stout.

#### GRAPE

Black Rot (*Guignardia bidwellii*), P. D. R. 108, 126, 157.

Table 42. Losses from black rot of grape as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	South Carolina	1-2	Massachusetts
3-10	Texas	1	Connecticut, North Carolina, Nebraska
5	New Jersey, Florida	0.5	Delaware, Arkansas
3	Maryland	Trace	Virginia, Illinois, Michigan, Minnesota
1-3	Wisconsin		

Downy Mildew (Plasmopara viticola). P. D. R. 128, 173.

Ripe Rot (Glomerella cingulata) North Carolina and Texas.

Dead Arm (Cryptosporella viticola) was reported from North Carolina, where it destroyed vines in a vineyard near Hamlet.

FRUIT BREAKDOWN and LEAF BLEACHING is severe in the Sand Hill areas of North Carolina on American and Vinifera varieties, but recovery results from the use of magnesium-potash salts.

DROUGHT INJURY was very prevalent and severe in Arkansas where it caused a great reduction in quality. Many berries either fell off or did not mature.

FROST INJURY: Ohio, considerable to tips of shoots and young beans. P. D. R. 128.

WINTER INJURY: Kentucky, vines severely killed back; Oklahoma, Arkansas, very prevalent and severe injury and killing especially in poorly drained areas; Washington, P. D. R. 63-64.

#### S T R A W B E R R Y

Dwarf (Aphelenchus fragariae). The results of a survey conducted by the Division of Horticultural Crops and Diseases during the summer of 1930 are shown in the accompanying map, Figure 20. The disease was already known to be abundant in the strawberry growing regions of Florida, Louisiana, and North Carolina. As the map shows, diseased plants were found during 1930 in western Tennessee and northern Arkansas in commercial plantings of standard varieties. Dwarf was found in the Norfolk region of Virginia and on the Eastern Shore (Virginia, Maryland, and Delaware) on plants brought into the region during the spring of 1930 or in experimental plantings. Strawberry growing areas in the following regions were visited but no dwarf disease was found: southeastern Tennessee (Chattanooga) southwestern Missouri (Ozark section), southern Illinois (Anna district), western, north-central, and south-central Kentucky (Paducah, Louisville, and Bowling Green), southern Indiana (New Albany), southwestern Ohio (Cincinnati). The field work was done by Paul V. Mook, and identifications of the nema were made by B. G. Chitwood.

A. N. Brooks reported that care in the selection of out-of-State nursery plants, together with the use of new land in raising plants, has tended to reduce the amount of dwarf in central Florida.



Root Rot (*Caconema radiciicola*) appears to be of importance in Arkansas plants intended for sale, as these must be culled. The loss of whole fields on this account is common (V. H. Young). In heavily infested areas in North Carolina this disease causes much stunting (R. F. Poole). In Florida, due to wet weather prevailing during the spring, the effect of root knot was not noticeable (A. N. Brooks). A specimen received from the State Entomologist at Ames, Iowa, was determined by Dr. G. Steiner as affected with the root knot nema. Also reported from Mississippi and Arizona.

Fruit Rots. Gray mold rot (*Botrytis cinerea*) is usually very rare in Louisiana. This year, however, about 80 per cent of all the berry rotting was caused by *Botrytis* (A. G. Plakidas). This rot was abundant in the northern section of Florida around Starke and Lawtey. It was present to some extent in the central area during February and March. (A. N. Brooks). Ten per cent loss was estimated in Massachusetts and 4 per cent in Missouri. Also in New Jersey, Texas, Washington.

Tan brown rot (*Pezizella lythri*). Due to the wet warm weather of February and March in Florida, this rot showed up in abundance and was the most noticeable of the field rots (A. N. Brooks). Much less than usual in Louisiana.

Hard brown rot (*Rhizoctonia* sp.) Florida, Louisiana, Texas. Leather rot (*Phytophthora cactorum*) caused 1 per cent loss in Missouri; also reported from Louisiana. Soft rot or leak (*Rhizopus nigricans*) North Carolina, Texas.

Anthracnose (*Colletotrichum fragariae*) was scattered but more widespread in Florida than last year. Bordeaux 4-4-50 was applied to a badly infected patch at ten day intervals during August, with subsequent decrease in the spread of the disease and increase in plant production (A. N. Brooks).

Root Rot (Undet., various fungi associated). P. D. R. 120, 173.

Mosaic (*Virus*). Tennessee, Wisconsin, P. D. R. 78.

Chlorosis: Texas, Nebraska, Arizona.

Yellows: Nebraska.

Drought Injury: Arkansas, very prevalent and important in cutting stand for coming season.

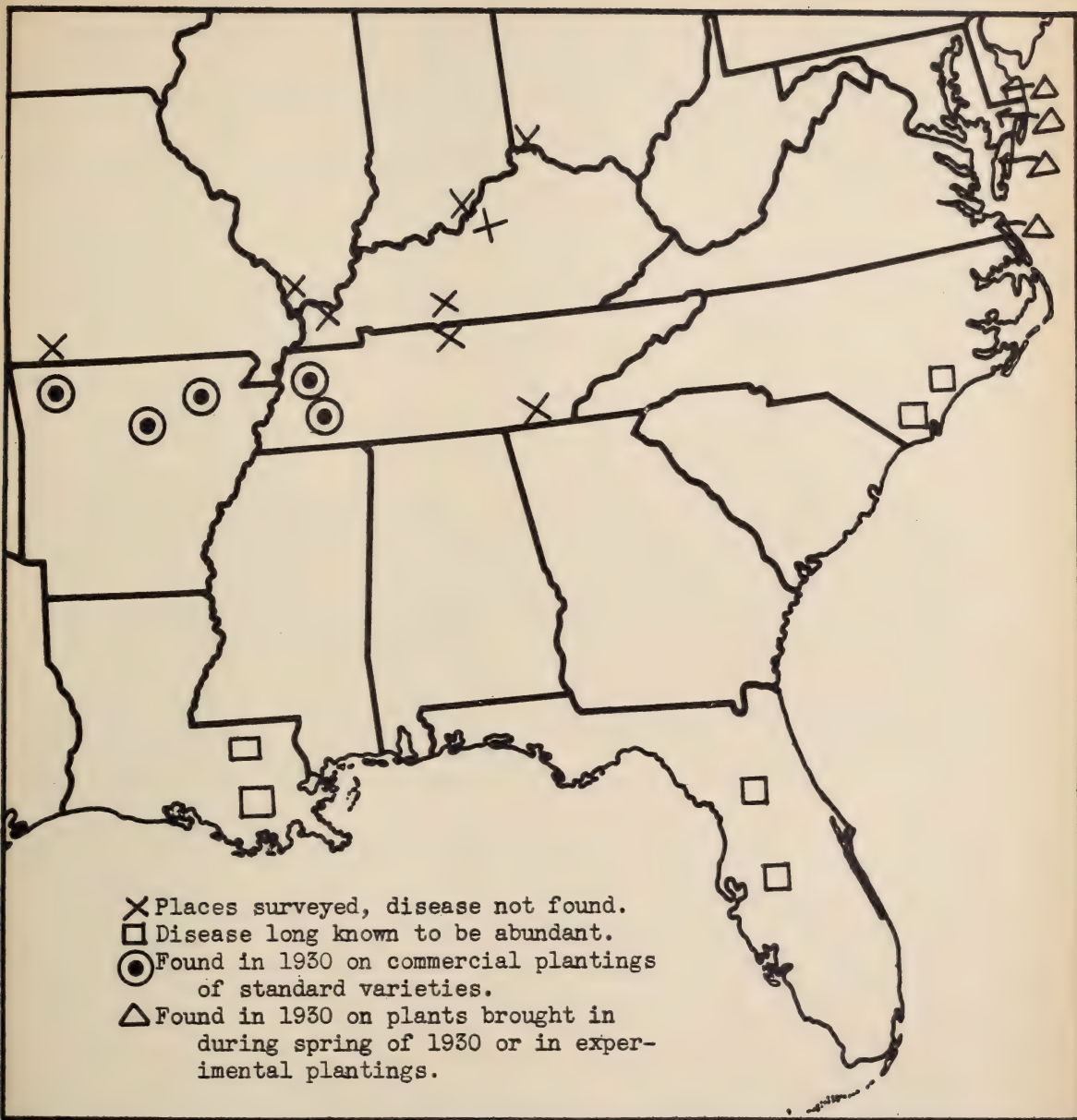


Figure 20. Known distribution of strawberry dwarf caused by *Aphelenchus fragariae*, 1930





# R A S P B E R R Y

Mosaic and Leaf Curl (Virus). P. D. R. 127, 157, 200.

Table 43. Losses from mosaic and leaf curl of raspberries as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
20	Massachusetts	3	Connecticut
11	Maine	2	Maryland, Kansas
7	Michigan	1	Montana
5	Virginia, Wisconsin,	Trace	Delaware, Indiana
	Minnesota		

Streak (Virus). More prevalent than usual and much more than last year in Pennsylvania while in New York it was about as prevalent as it has been for several years.

Orange Rust (Gymnoconia interstitialis and Kunkelia nitens) was very important in southwestern Michigan where it is the limiting factor in production. It is very prevalent on wild dewberries there and spreads from them to the cultivated raspberries.

Anthracnose (Plectodiscella veneta). In general, this disease was of equal or greater prevalence than last year in the States reporting except in Ohio and also in Arkansas where it usually is a limiting factor. In Missouri, it seems to be increasing in severity. It was general and serious in eastern Nebraska. The losses estimated by collaborators are: Missouri, 5 per cent; Maryland, 3 per cent; West Virginia, 2 to 3 per cent; and Michigan, a trace. P. D. R. 127, 157, 173.

Blue Stem (Verticillium albo-atrum). Massachusetts, New Jersey, Michigan, Washington, and said to occur in California. P. D. R. 157.

Root Rot (Xylaria sp.) Washington on red raspberries.

Crown Gall (Bacterium tumefaciens). P. D. R. 201.

Winter Injury: In Minnesota, winter and drought injury combined was the biggest factor in the low yield obtained this year. Also reported from five counties in Washington.

BLACKBERRY

Double Blossom (Fusicorporium rubi). New Jersey, North Carolina, Florida, and District of Columbia. P. D. R. 78.

Sooty Blotch (Gloeodes pomigena). North Carolina.

Fly Speck (Leptothyrium pomi). North Carolina, first report from State to the Survey.

Root Rot (Collybia dryophila). North Carolina.

Frost Injury: Arkansas, very prevalent and severe. Crop practically ruined in all sections.

LOGANBERRY

Orange Rust (Gymnoconia interstitialis). Mississippi. First report on this host to the Survey.

CURRENT

Gray Mold (Botrytis cinerea). New Jersey, causes leaf spots and fruit decay.

CRANBERRY

Fruit Rots (fungi). Massachusetts, various bogs in Wareham area showed 8.9 per cent rot October 15 and 13.1 per cent November 15, as compared to 5.9 and 11.7 per cent in 1929.

Fairy Ring (Mushroom). Massachusetts. Not uncommon in Plymouth County bogs.

False Blossom (Virus). Massachusetts; increasing from year to year. New York; found for the first time. Wisconsin; about as prevalent as usual. P. D. R. 245-246.

Leaf Drop (Undet.). Wisconsin; less than usual.

BLUEBERRY and HUCKLEBERRY

A report on the occurrence of diseases of these hosts in Maine in 1929 and 1930 is given in the "Plant Disease Reporter", Vol. 15, No. 25, pp. 11-14, March 1, 1931.

Stem Rust (Calyptospora columnaris) on huckleberry was reported from Washington and on V. corymbosum from Connecticut.

## M U L B E R R Y

Bacterial Blight (Bacterium mori) was reported from San Diego and Santa Clara Counties, California. (Scott and Stout).

Leaf Spot (Cercospora mori) attacked 100 per cent of the foliage, causing defoliation a month earlier than usual under conditions at College Station, Texas. (Taubenhaus).

Pop Corn Disease (Sclerotinia carunculoides). North Carolina, Texas.

## C I T R U S

Canker (Bacterium citri). Found in a nursery at Telferner, Victoria County, Texas. Five grapefruit trees and 15,000 two-year-old plants of C. trifoliata were destroyed immediately after the discovery of the disease. This is the first appearance of the disease in Texas since February, 1929. No other States reported its presence in 1930. P. D. R. 157.

Root Rot (Clitocybe tabescens). Florida, on grapefruit, orange, and tangerine. First report of this disease on citrus. P. D. R. 168.

Blotch. Florida on grapefruit, new and unusual, severe in some cases. P. D. R. 68.

Lumpy Rind. Florida, on grapefruit and sometimes on oranges. Unusually prevalent. P. D. R. 67.

Bark Rot on orange, Florida, P. D. R. 169.

Scaly Bark (psorosis) on grapefruit, becoming severe in Texas.

## F I G

Dieback (Sclerotinia sclerotiorum). Texas.

Fruit Rot and Canker (Colletotrichum caricae). Georgia, more destructive of whole limbs than of fruits. The canker starts on large limbs and gradually girdles them. (J. H. Miller).

Root Knot (Gaeonema radicum) Texas, California. P. D. R. 202.

Nematode (Tylenchus pratensis). California. P. D. R. 202.

Yeast Rot (Yeast) California, fruit rots on tree in moist weather. Rhizopus and other fungi also cause spoilage.



D A T E

The following diseases were reported from southern California by L. J. Klotz.

Inflorescence Decay (Thielaviopsis paradoxa (T. ethacetica)). Only three palms found infected.

Bud Rot (Thielaviopsis sp. principal fungus present).

Fruit Rots (Alternaria sp., Penicillium sp., Aspergillus niger, Helminthosporium sp.), less than usual, no rains during ripening period. Very important in most years.

Rot of stored dates (Catenularia fuliginea).

Decline of trees (Undet.). Becoming more important, slowly spreading from definite foci. Deglet Noor very susceptible.

P E R S I M M O N

Fruit Spot (Macrophoma diospyri). North Carolina, abundant on heavily fruit-laden trees.

B A N A N A

Wilt (Fusarium cubense). Porto Rico, very severe.

Leaf Scorch (Gloeosporium musarum). Porto Rico, always present on ripe fruit.

P A P A Y A

Soft Root Rot (Pythium sp. associated). California, two small orchards in Orange County have lost many plants in winter and on through summer with a soft rot of roots from which a Pythium was easily isolated. (Wm. T. Horne).

P E I J O A S E L L O W I A N A

Root Rot (Phymatotrichum omnivorum). Texas, first report on this plant.

C O C O N U T

The following diseases are reported from Porto Rico.

Bud Rot (Phytophthora faberi). This disease, which first appeared in Porto Rico in 1923, has gradually extended eastward from the west coast both along the south coast and the north coast until it has reached the eastern shore. A recent survey reports 5,071 infected coconut palms out of 780,888 on farms in the Island and 4,705 infected hat palms out of 418,378. Eradicatory measures are being intensified. P. D. R. 15: 23.

Fruit Drop (Thielaviopsis paradoxa), may be of greater importance than previously supposed.

Little Leaf (Undet.) Common. Occurs on isolated palms, especially on those growing along roadsides.

Wilt "Marchitez" (Undet.) Very common in marshy sites.

Red Trunk, nematode disease (Aphelenchus cocophilus). Rare.

Trunk Rot (Undet.). Common in the vicinity of San Germain. Another trunk rot observed in the vicinity of Mayagüez.

P E C A N

Brown Leaf Spot (Cercospora fusca). Heavy and prevalent on all varieties at station planting at Willard, North Carolina, for past five years, but none at field station at Rocky Mount although same varieties are planted. Reported from Mississippi and Texas.

Kernel Spot (Stink Bug). Very severe in North Carolina, especially on trees in home lots, on which, in many instances, there is a total loss. Unusually common in Texas where the loss to the crop is estimated to be 50 per cent.

Rosette (physiological). Observed in North Carolina and Arkansas. Common and generally distributed in thirteen counties of Texas. Known to be present in certain southern California counties.

A L M O N D

Shot Hole (Coryneum beijerinckii) is gradually becoming important in almond districts in California.

Brown Rot (Sclerotinia cinerea). In California, serious only as a blossom blight in Drake variety.

## D I S E A S E S   O F   V E G E T A B L E S

### P O T A T O

Late Blight (*Phytophthora infestans*). With the exception of Florida, which reported much more blight than usual, potato-growing States in all sections of the country reported less damage than normal. This is well shown by the maps, Figures 21 and 22. Generally, this reduction in the amount of blight was attributed to the unusually dry growing season.

In Maine, blight made its appearance in Aroostook County unusually early, July 14, and caused moderate losses in that section. (P. D. R. 142). Maine potatoes on the New York market during the first two weeks of January, 1931, showed about the usual amount of late blight tuber rot. (P. D. R. 15 (1): 7. 1931).

In Florida, where rainfall was plentiful in the winter and spring months, late blight caused unusually heavy losses during midseason of the growing crop. It was first observed January 15 at Fort Pierce by Gratz, who furnished the loss estimate for the State.

Losses from late blight as estimated by collaborators are included in Table 44.

Table 44. Losses from late blight of potato as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss :	States reporting	loss :	
15 :	Florida	1 :	Maryland, Georgia
8 :	Maine	Trace :	Massachusetts, New York
:		:	

The following States, which ordinarily report losses for late blight, indicated "no loss", "not seen", or "of no importance", etc.: Connecticut, New Jersey, Pennsylvania, Virginia, North Carolina, South Carolina, Arkansas, Michigan, Minnesota, and Wisconsin.

Early Blight (*Alternaria solani*). In general early blight caused slight loss, as usual. In Nebraska, it was much more prevalent than usual in early plantings of commercial areas, damaging both the tops and tubers. In Florida, P. M. Lombard reported that early blight appeared in the Wabasso section about February 7-10 and caused heavy damage at Fort Pierce. Pennsylvania reported scattered infections on unsprayed fields of early varieties only. P. D. R. 132.



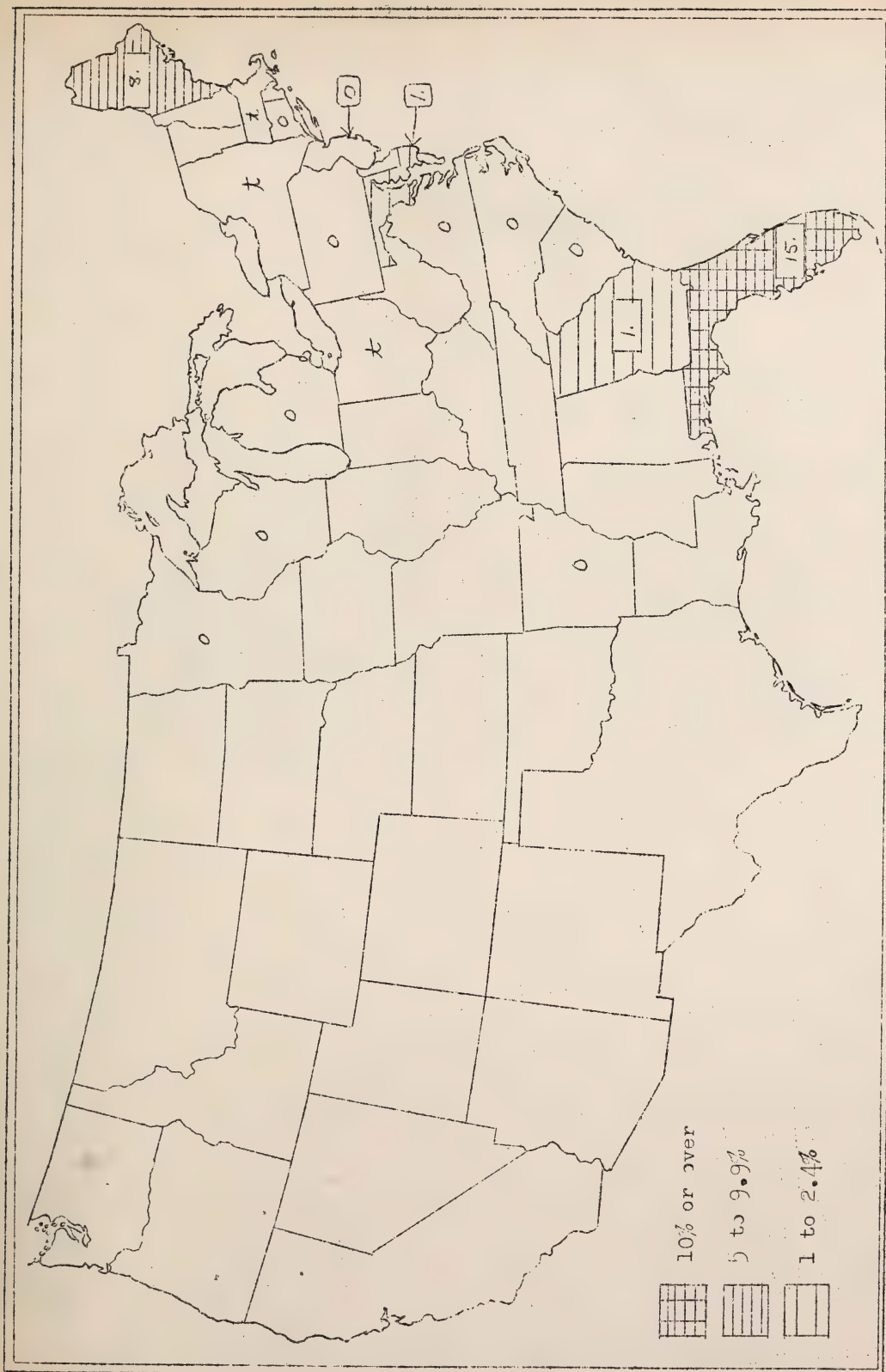


Figure 21. Percentage losses from potato late blight as estimated by collaborators, 1930.

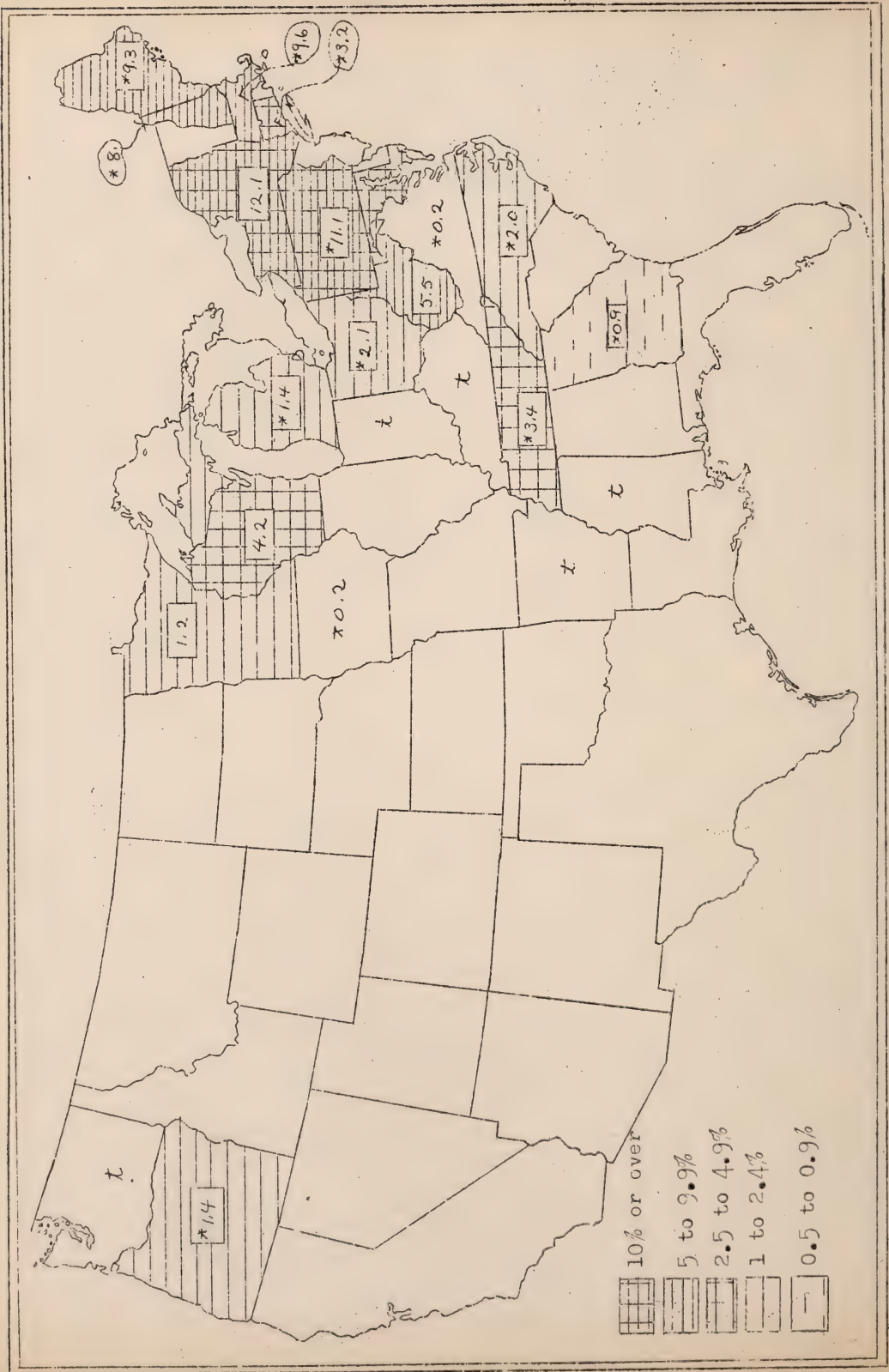


Figure 22. Percentage losses from late blight of potato for the period 1920 to 1929.

Table 45. Losses from early blight of potato as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
3	Louisiana	0.1	Michigan, Montana,
2	Maine		Texas
Trace - 3	Florida	Trace	Massachusetts, Connecti-
1.5	South Carolina		cut, New York, New Jersey,
0.5	Maryland		Delaware, Virginia,
			Kentucky, Arkansas,
			Wisconsin, Minnesota,
			South Dakota, Nebraska

Stem Rot (*Corticium vagum*). In spite of the drought, States that reported loss estimates for this disease indicated quite a variation in the amount of damage as compared with losses in the average year. New York, Florida, Minnesota, Missouri, and Kansas reported normal losses; New Hampshire, New Jersey, Pennsylvania, Maryland, Arkansas, and Nebraska, more than usual; and Massachusetts, West Virginia, and Wisconsin, less than the amount for the average year. Both the sprout-infection and rosette or "Rhizoctonia-hill" stage were reported from Pennsylvania, Arkansas and Massachusetts. Washington and Porto Rico also reported occurrence of the disease. P. D. R. 132, 217.

Table 46. Losses from Rhizoctonia stem rot of potato as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	South Carolina	2	Maine, North Carolina,
7	Kansas		New Jersey, Missouri,
6	Maryland	1.5	Texas, Nebraska
5	New York	1	Wisconsin
4 to 5	Pennsylvania	0.5	Massachusetts, Florida
4	Minnesota	Trace	Michigan
3	Montana		Connecticut, Delaware,
2.5	West Virginia		Virginia, Louisiana,
			Arkansas



Scab (*Actinomyces scabies*). As in 1929, there appeared to be an increase in the amount of scab in the drought areas. More than usual was reported from New York, Maryland, West Virginia, North Carolina, Wisconsin, and Minnesota; less than the usual amount was observed in Massachusetts, Pennsylvania, and New Jersey; and the usual amount in Florida, Delaware, Arkansas, Missouri, South Dakota, Nebraska, Porto Rico, and Kansas. R. F. Poole reported from North Carolina that scab was more severe than during the past three years in Mt. Olive and other eastern counties, and in the drought areas of the northwestern part the crop was badly scabbed. The estimated losses from scab are indicated in the following table.

Table 47. Losses from potato scab as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
8-9	West Virginia	3	New Jersey
5	New York, Wisconsin	2	Maryland, Missouri, Kansas
4	Minnesota, South Dakota, Nebraska	0.1	Texas
		Trace	Massachusetts, Florida

Mosaic (virus). Reports indicate about the usual prevalence of mild and rugose mosaics, with considerable masking of symptoms due to unusually high temperatures. Nine States reported the same amount of mosaic as in average years; two reported more; and two, less than normal. Loss estimates are included in Table 48. P. D. R. 132, 196.

Table 48. Losses from potato mosaic disease as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
15	Arkansas	2	Maine, North Carolina, Indiana
10	Massachusetts	1.5	New Jersey
5	Louisiana, Minnesota, Montana	1	Michigan, Nebraska
4	New York	0.5	Delaware, Texas
2.5	Maryland, West Virginia	Trace	South Carolina, Florida, Wisconsin

Additional States reporting the occurrence of potato mosaic are: New Hampshire, Pennsylvania, Kentucky, Mississippi, Minnesota, Kansas, Oregon, California, and Porto Rico.

W. D. Valleau in Kentucky makes the following statement: "Mosaic (apparently rugose) of Cobbler potatoes was prevalent in first and second crops. It is caused by the tobacco veinbanding virus together with the 'healthy-potato' virus. The veinbanding virus spreads extremely rapidly in tobacco and consequently there appears to be some means (probably insect) for its rapid dissemination in these crops. In a series of planting date trials one series was found to have considerable streak. The veinbanding and the healthy potato viruses were transferred to tobacco from this series. This combination of viruses was likewise found to cause streak in seedling potatoes."

Leaf Roll (virus). Generally, the usual amounts of leaf roll were reported. Losses were above normal in Maryland due to the use of much home-grown seed for the spring crop of Cobblers. New Jersey reported less than usual, and the following States normal losses: New Hampshire, New York, Pennsylvania, West Virginia, Florida, Louisiana, Arkansas, Wisconsin, and Minnesota. Washington reported the disease from the Puget Sound section. P. D. R. 132, 142.

Table 49. Losses from leaf roll of potato as estimated by collaborators, 1930.

Percentage:			Percentage:		
loss	:	States reporting	loss	:	States reporting
10 to 15	:	Pennsylvania	2	:	North Carolina
7	:	New York	1	:	West Virginia, Michigan
5	:	Massachusetts	0.5	:	Delaware
4	:	Maine, Indiana	0.1	:	Texas, Montana
2.5	:	New Jersey, Maryland	Trace	:	South Carolina, Florida,
	:			:	Louisiana, Arkansas,
	:			:	Wisconsin

Spindle Tuber (virus). Of the six States reporting upon spindle tuber, all indicated normal losses except New Jersey where subnormal amounts occurred. Montana and Kansas reported 2 per cent losses, New Jersey 0.5 per cent, and Florida and New York traces.

Wilt (*Fusarium* spp.) Mostly normal to above normal amounts of *Fusarium* wilt were indicated by collaborators. Connecticut, New York,

Pennsylvania, and Minnesota reported more than the average loss; New Jersey, South Dakota, and Nebraska the same amount as usual; and Missouri, less than usual. Four States indicated the hot, dry weather as favoring the disease. In Nebraska, 4 to 5 per cent infection by F. eumartii occurred in the field and bin, while slight loss resulted from F. oxysporum. Wilt was more common on sandy than loam soils in North Carolina.

Table 50. Losses from potato wilt as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
4	: Montana	0.5	: New Jersey
3 to 4	: Pennsylvania	Trace	: Connecticut, New York,
2	: Maryland		: Delaware, Florida,
1	: Nebraska		: Texas, Minnesota,
			: Missouri, South Dakota

Blackleg (Bacillus phytophthorus). Reports indicate either normal or subnormal amounts of this disease. States that reported the occurrence of blackleg, other than those included in the accompanying table are: New Hampshire, New Jersey, Mississippi, Indiana, and Nebraska. P. D. R. 82.

Table 51. Losses from blackleg of potato as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
3	: Maine	0.5	: Wisconsin
2	: Kansas, Montana	0.4	: Missouri
1	: Kentucky, Florida,	Trace	: New York, Maryland, North
	: Michigan, Minnesota		: Carolina, Louisiana, Texas,
			: Arkansas, South Dakota,
			: Nebraska

Tipburn and Hopperburn (climatic and leafhoppers). That these diseases are usually important in many States is shown by the map in Figure 24. Most of the States that submitted reports in 1930 indicated more, or much more, loss than for the average year, and cited the unusually hot, dry season as an important contributing factor. P. D. R. 163, 177, 196.



Table 52. Estimated percentage losses from tipburn and hopper-burn of potatoes in 1930, and comparisons with previous years.

Percentage: loss	State : Reporting	: Comparison with Other Years
30	: Arkansas	: 31 per cent in 1929; 30 in 1928
25	: West Virginia	: Loss always high; equalled 1930 in 1921 and 1926
15	: Massachusetts	: 10 in 1929
	: New York	: Same in 1929
	: Minnesota	: Same in 1924 and 1926
10	: Maryland	: Much the greatest loss reported since 1920; highest previous 1.5
8	: New Jersey	: Same in 1929; 7 in 1926
6	: Michigan	: Much heavier loss in 1921 (20), and 1922 (10)
4	: Wisconsin	: 10 in 1921
3	: Connecticut	: 10 in 1922
	: North Carolina	: About average; 8 in 1929.
1	: Louisiana	: About average
0.5	: Delaware	: 25 in 1926 - only high loss.
	:	: Never much loss reported.

DROUGHT INJURY, FERTILIZER INJURY (climatic, fertilizers). Combined dry weather and fertilizer injury was reported from South Carolina and North Carolina, being more pronounced in poorer, sandy soils. A type of "internal necrosis" observed in Minnesota was thought to have resulted from late rains following the drought. South Dakota reported a loss in storage of 15 per cent from decay which was attributed to fall rains following the drought. In Kentucky, heavy losses of the first crop potatoes, both in the ground and in storage, were considered to be due probably to the extremely hot weather. Fertilizer injury was assigned as the cause of 50 per cent reduction in stand in one Long Island potato field (W. G. Been, New York Weekly News Letter, May 26, 1930). Washington reported a decay of tubers in the Yakima Valley, apparently associated with hot weather.

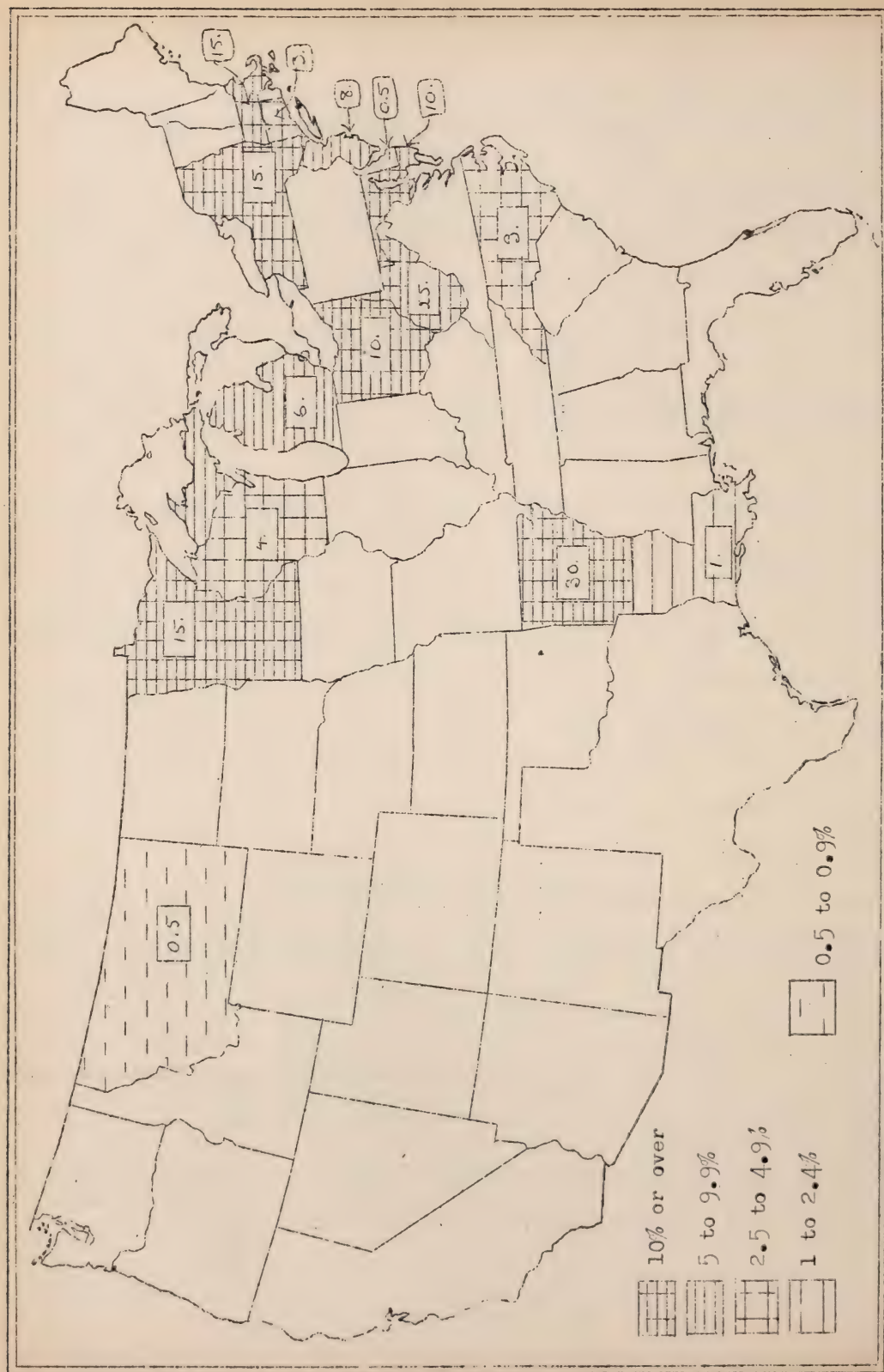


Figure 23. Percentage losses from potato tipburn and hopperburn as estimated by collaborators - 1930





Southern Blight (Sclerotium rolfsii). Tennessee, common in spring crop; Arkansas, severe epidemic at Prescott; Florida and Porto Rico, traces; and Texas, 75 per cent and 5 to 10 per cent tuber infection in Hidalgo and Cameron Counties, but only 0.1 per cent loss for the State. P. D. R. 96, 176.

Root Rot (Phymatotrichum omnivorum). Texas, very scarce this year.

Violet Root Rot (Helicobasidium purpureum (Rhizoctonia crocorum), Oregon. P. D. R. 82.

Yellow Dwarf (Undet.) New York, more than usual, trace loss, favored by hot weather.

Psyllid Yellows (potato psyllid). California, severe in San Diego County, also found at Shafter.

Witches' Broom (virus). Washington; Wisconsin, on Montana seed, Triumph susceptible.

Lightning Injury: New York, in one field.

"No Sprout Potatoes" (Undet.). For several years much complaint has been made of poor germination throughout North Carolina. In most cases the trouble is in Irish Cobbler seed from Prince Edward Island. Instead of normal sprouts a small tuber is formed. Losses are readily traced to individual sacks, since potatoes from some sacks germinate perfectly while those from others give scattering stands. There is no evidence of parasites and it is suspected that storage conditions may account for the trouble, since potatoes held in cold storage have shown much less than those in dry storage. (R. F. Poole).

## T O M A T O

Wilt (Fusarium lycopersici). Five States reported normal losses from wilt, six indicated less than usual, and two more than for the average year. In some States the disease appeared to be favored by the unusually hot, dry weather, while in others there were indications that the effect of high temperatures was offset by the soil moisture conditions unfavorable to infection. Mississippi and Colorado reported occurrence of the disease. Loss estimates for other States are in the accompanying table. P. D. R. 110, 129, 161.

Table 53. Losses from Fusarium wilt of tomato as estimated by collaborators, 1930.

Percentage: loss	States reporting	Percentage: loss	States reporting
10	Arkansas	2	Missouri, Kansas
5	South Carolina, Louisiana, Texas, Indiana	1	Massachusetts, North Carolina
4.5	New Jersey	0.5	Maryland
3	Virginia, Florida, Michigan	Trace	Delaware, Kentucky, Wisconsin

Early Blight (*Alternaria solani*). Generally, less damage was reported than usual. Normal losses occurred in Louisiana. Both defoliation and fruit rotting were observed in Maine. P. D. R. 110, 129, 130, 176, 177.

Table 54. Losses from early blight of tomato as estimated by collaborators, 1930.

Percentage: loss	States reporting	Percentage: loss	States reporting
10	Massachusetts	0.5	New Jersey, Texas
3 to 5	New York	0.1	Indiana
2	Florida, Louisiana	Trace	Connecticut, North Carolina, Michigan,
1	Maryland, South Carolina, Arkansas		Wisconsin, Montana, Porto Rico, Nebraska

Blight (*Septoria lycopersici*). Less, to much less, damage was reported generally for tomato blight as shown in Figures 25 and 26. More than usual was observed in Massachusetts, much less than normal in Maryland and North Carolina, and none in Florida. P. D. R. 110, 130, 160.

Table 55. Losses from Septoria blight of tomato as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
3	Maine	0.5	Delaware, Texas
2.5	New Jersey	Trace	Connecticut, Maryland, Virginia, Kentucky, North Carolina, Louisiana, Indiana, Michigan, Minnesota
2	Wisconsin, Missouri, Kansas		
1	Massachusetts, South Carolina, Arkansas, Nebraska		

Bacterial Canker (*Aplanobacter michiganense*). Compared with losses in average years, States reported as follows: much more, Massachusetts and Mississippi; more, New Jersey and Minnesota; same, Wisconsin; less, Maryland and California. In Minnesota, canker was observed for the first time, occurring mostly as fruit spots along with *Bacterium vesicatorium* fruit spots. Fruit-spotting was reported on the Chicago market in shipments from Texas, thus constituting a first report from that State. In Massachusetts, the disease was more widespread and severe in both field and greenhouse tomatoes than ever observed before, causing an estimated loss of about 4 per cent. A detailed account of the severe outbreak of canker in Mississippi occurs on Page 134-140 of the 1930 Reporter. Contaminated and infected seed lots from out-of-State sources were considered responsible for the situation in that State. In California, the decrease in loss from canker is attributed to more care in selection of seed and in attention to seed beds. A loss of 30 per cent in one field in Washington was associated with a certain source of seed; crops from other seed sources remaining canker-free. Additional States that reported the presence of the disease are New York and Michigan. P. D. R. 96, 130, 134-140, 160, 161, 176.

Bacterial Spot (*Bacterium vesicatorium*). This disease occurred in New Jersey in usual amounts with moderate loss; produced only traces of loss in Maryland and Texas; was more important than usual in Indiana, with an estimated loss of 0.1 per cent; and was observed for the first time in Minnesota occurring along with bacterial canker. A severe outbreak was observed in a localized region in Indiana, with a blighting of the tips of branches. In Florida, it was observed only on the west coast. P. D. R. 110, 130.





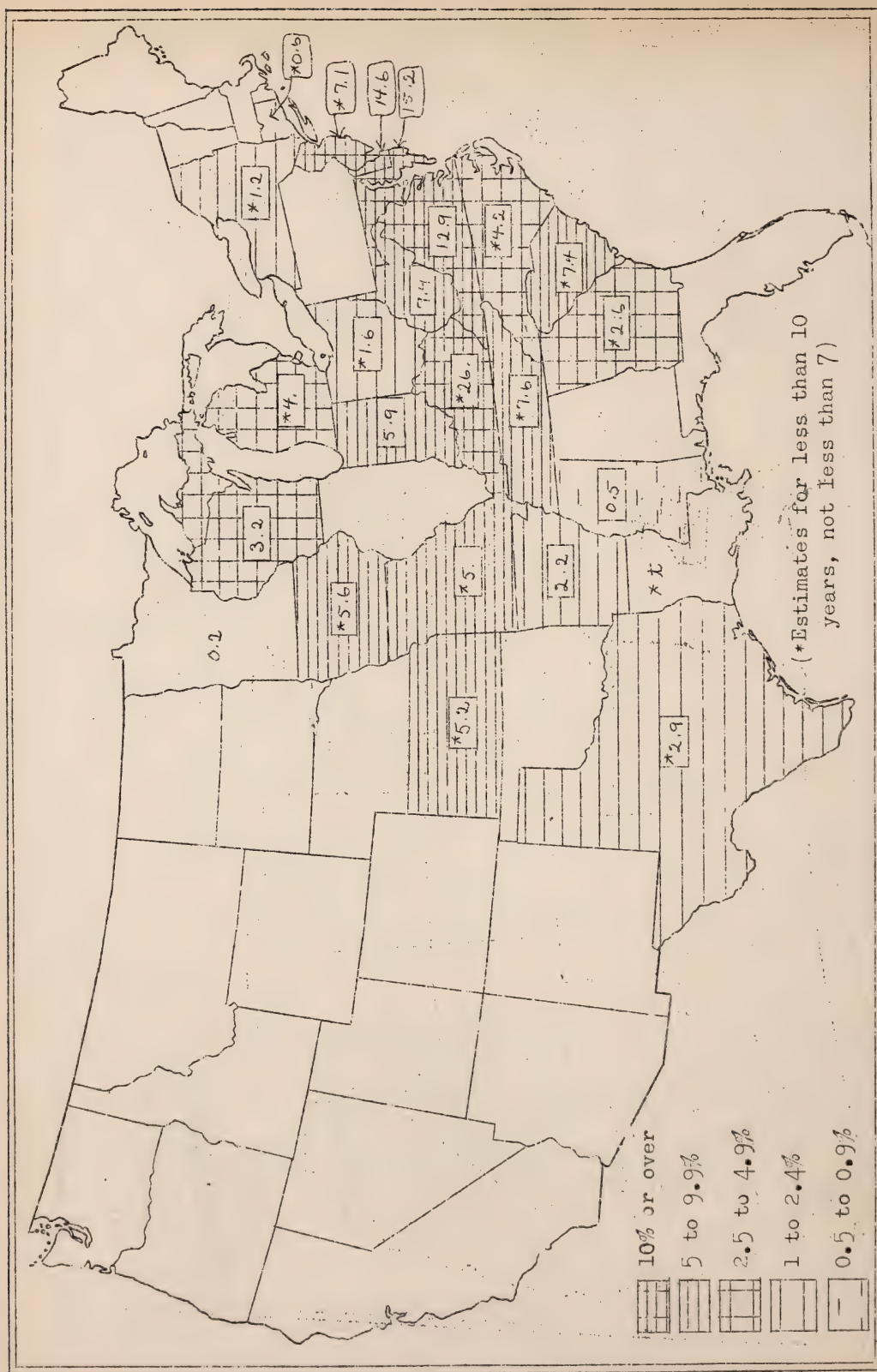


Figure 26. Percentage losses from Septoria blight of tomato for the period - 1920 to 1929.

Leaf Mold (Cladosporium fulvum). About the usual amount of damage occurred in Massachusetts, Maryland, Louisiana, Indiana, and Wisconsin; less than normal in Florida and Michigan. Heavy losses were indicated for greenhouse crops in Massachusetts and Indiana, the former State reporting 5 per cent damage. Other States, including Washington and Porto Rico, indicated only traces, or otherwise slight losses. P. D. R. 176.

Blossom-End Rot (Non-parasitic). Losses above normal were reported from Massachusetts, New Jersey, Delaware, Maryland, Arkansas, Indiana, and Minnesota; and lower than usual from Wisconsin and Kansas. Washington and Mississippi reported its presence. Four collaborators attributed the unusual losses to the extremely hot, dry weather. P. D. R. 162.

Table 56. Losses from blossom-end rot of tomato as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss :	States reporting	loss :	States reporting
25	: Virginia	2	: New Jersey
7	: Maryland	1	: Connecticut
5	: Indiana, Minnesota	0.5	: Texas
4	: New York	Trace	: Massachusetts, Nebraska

Mosaic (virus). About the usual amounts of loss occurred in greenhouses generally, and somewhat less than normal in field plantings. States that reported tomato mosaic, not included in the page-references below are: New Jersey, Maryland, Mississippi, Indiana, Michigan, Wisconsin, Kansas, Montana, Washington, California, and Porto Rico. P. D. R. 110, 129, 160, 175, 177.

Collar Rot (various organisms). Reports from the following States indicate unusual prevalence of the disease: Delaware, very prevalent in late plantings; Indiana, destructive in one county on Arkansas plants; Maryland, general and severe in plant beds, loss 3 per cent; New Jersey, 2 per cent loss, very severe in some beds; Arkansas. P. D. R. 129.

Root Knot (Gaeonema radicum). Caused 3 per cent loss in greenhouses in Massachusetts. Carbon disulphide emulsion method for disinfection of soil has given very good control (Guba). Also reported from North Carolina, Mississippi, Texas.



Fruit Spot (Phoma destructiva). Florida, severe; New Jersey; Texas, 1 per cent loss. P. D. R. 130.

Late Blight (Phytophthora infestans). North Carolina, less than usual, little loss; Texas, traces.

Buck-Eye Rot and Blight (Phytophthora terrestris). New York, in greenhouses, first report to the Survey; Florida, more than usual.

Soil Rot (Corticium vagum). Florida, unusually prevalent due to wet season; North Carolina, severe on late crop; Texas, 5 per cent loss.

Wilt (Verticillium albo-atrum). Massachusetts, general in field plantings, 2 per cent loss; trace loss in greenhouses. According to E. F. Guba the species is V. ovatum Berkeley.

Stem Rot (Sclerotinia sclerotiorum). Washington, P. D. R. 176.

Fruit Rot (Oospora lactis). North Carolina.

Dodder (Cuscuta sp.). New York, one specimen.

Drought Injury: Great reduction in yield in Kentucky, and 20 per cent loss in Delaware and Arkansas.

Sunscald: Losses of 3 per cent in Missouri and 5 per cent in New Jersey.

Lightning Injury: Connecticut.

## P E P P E R

Bacterial Spot (Bacterium vesicatorium). Florida; Massachusetts, first report, observed in three counties. P. D. R. 189.

Mosaic (virus). Evidence indicating seed transmission is reported from New Jersey. Mosaic was also reported from Connecticut, Virginia, Porto Rico. P. D. R. 177, 189.

Blossom-End Rot (non-parasitic). Generally more than usual; North Carolina, 1 to 3 per cent loss; Florida, 50 per cent loss; Virginia, 75 per cent loss; Mississippi, Porto Rico. P. D. R. 189.

Fruit Rot (Vermicularia capsici). Porto Rico, traced to Georgia seed.

Fruit Rot (Colletotrichum nigrum) caused 10 per cent reduction in yield in South Carolina; also occurred in Porto Rico.

Twig Blight (Sclerotinia sclerotiorum). Florida. P. D. R. 189.

Dodder (*Cuscuta* sp.). About one per cent of the plants in one field in Virginia were attacked and seriously stunted. This is the first report to the Survey of dodder on this host.

Sunscald: New York, trace to 2 per cent loss; Florida, New Jersey, Porto Rico; Texas, 2 per cent loss.

### E G G P L A N T

Wilt (*Verticillium alboatrum*). Losses from wilt in Massachusetts and New Jersey were as severe as usual, with 10 per cent reduction of the crop in Massachusetts. In New Jersey, slight degrees of resistance were observed in some of the foreign varieties and species under test. Less than normal in Wisconsin.

Wilt (*Rhizoctonia microsclerotia*). Porto Rico.

### S W E E T P O T A T O

Black Rot (*Ceratostomella fimbriata*).

Table 57. Losses from black rot of sweet potato as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	Texas	2	Delaware, South Carolina
8	Kansas	1.5	Missouri, Maryland
5	Arkansas, New Jersey	1	Florida
3	North Carolina	Trace	Indiana, Virginia

Stem Rot, Wilt (*Fusarium* spp.)

Table 58. Losses from stem rot or wilt of sweet potato as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
12	New Jersey	1.5	Missouri
5	Arkansas, Kansas, Delaware	1	Indiana, Maryland, Texas
2	North Carolina	Trace	Florida, Kentucky, South Carolina

Scurf (Monilochaetes infuscans). Percentage losses reported are as follows: New Jersey, 4; Virginia, 1; Maryland, 0.5; Texas, trace.

Root Knot (Caconema radicum). North Carolina reported more loss than usual, and indicated the Jersey and Porto Rico varieties and strains as resistant. Other States reporting: Arkansas, Mississippi, and Texas.

Brown Ring (Tylenchus dipsaci). An account of the first report of this pest on sweet potatoes in New Jersey and Maryland occurs on Page 109 of the 1930 Reporter. In New Jersey affected potatoes were found in two storage houses. Diseased roots when bedded produced few, but clean sprouts.

"Scald and Internal Necrosis" (apparently non-parasitic). Caused a loss of 200 bushels per acre in one field of Yellow Jersey in Indiana. It resembled mottle-necrosis caused by *Pythium*, but no organism could be isolated. (Gardner).

Brown Rot (Sclerotinia sp. associated). North Carolina, a late storage trouble in houses and banks causing a firm rot on all varieties observed; no external mycelium.

Mosaic (Undet.). Trace in Texas; not observed in Arkansas.

#### B E A N

For a full account of the bean disease survey of western States, including Colorado, Utah, Montana, Wyoming, Idaho and California, by W. J. Zaumeyer, see Page 228-239 of the 1930 Reporter.

Anthracnose (Colletotrichum lindemuthianum). Losses from anthracnose generally, as indicated by collaborators, were from less to much less than usual. P. D. R. 95, 131, 199.

Table 59. Losses from bean anthracnose as estimated by collaborators, 1930.

Percentage:			Percentage:		
loss	:	States reporting	loss	:	States reporting
3	:	Missouri	Trace	:	Delaware, North
	:			:	Carolina, Mississippi,
2	:	Massachusetts, Florida		:	Texas, Arkansas,
	:			:	Michigan, Minnesota
1	:	Maine, Wisconsin		:	
	:		None	:	Virginia, Montana
0.5	:	Maryland, South		:	
	:	Carolina, Louisiana		:	



Bacterial Blight (Bacterium phaseoli, etc.). Losses from blight in the more severely drought-stricken areas of the East and South were greatly reduced. In parts of New England, and in New York, Wisconsin, and New Jersey, losses were about normal; in West Virginia, North Carolina, South Carolina, and Mississippi, much less than usual. Heavy infections occurred in New York State on Red Kidney beans from California, "but apparently not from the Sacramento Valley." In Louisiana where losses were above normal, blight was most general on Colorado seed. Michigan reported much more infection on Red Kidney than other varieties. Colorado indicated traces of blight in northern sections, and severe infections near Sterling and in the Arkansas Valley.

Halo Blight (Bacterium medicaginis phaseolicola) was reported from Massachusetts where it was more prevalent but less damaging than B. phaseoli. In South Carolina Armstrong reports only a few scattered infections in the College variety tests as compared with heavy damage in 1929. P. D. R. 95, 131, 162, 199.

Table 60. Losses from bacterial blights of bean as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	Louisiana	2	Texas, Montana
8	Massachusetts	1	Maryland, South Carolina, Florida
6	Maine	Trace	Delaware, North Carolina, Arkansas
5	Wisconsin, Michigan	None	Virginia
2 to 5	New York		

Mosaic (Virus). Losses were more or less normal generally with the usual emphasis upon the susceptibility of Refugee varieties. P. D. R. 95, 177.

Table 61. Losses from bean mosaic as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	New York	0.5	Maryland
4	Montana	Trace	Massachusetts, North Carolina, Florida,
2	Maine, Minnesota		Louisiana, Michigan
1	Virginia, Texas, Wisconsin		

Root Rots (*Fusarium* spp., *Rhizoctonia* sp., etc). These diseases were general in New York State, unusually severe and apparently aggravated by the drought in Virginia, Maryland and West Virginia, and caused heavy losses in Louisiana following a long rainy season. In South Carolina normal losses were reported from the lower half of the State. In Texas serious reductions in stand were observed in two counties. P. D. R. 31, 95.

Table 62. Losses from bean root rots as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	South Carolina	1	Montana, Minnesota
5	New York, Virginia, Louisiana, Texas	Trace	Massachusetts, Florida, Michigan, Wisconsin
3	Maryland		

Powdery Mildew (*Erysiphe polygoni*). Unusual severity of this disease was observed in Maryland, Virginia, and North Carolina. In Virginia, prominent infection of stems, leaves, and pods appeared to be favored by heavy dews during the latter part of the growing season, and caused an estimated loss of 12 per cent. In Texas, the disease was severe in Hidalgo and Cameron Counties, and accounted for a loss of 2 per cent for the State. Porto Rico also reported this disease. P. D. R. 217.

Angular Leaf Spot (Isariopsis griseola). One report in each Massachusetts and New Jersey. P. D. R. 199.

Stem and Pod Spot (Sclerotinia sclerotiorum). Massachusetts. P. D. R. 217.

Lightning Injury. New York, in one field.

### L I M A   B E A N

Bacterial Spot (Bacterium vignae). Slight losses were indicated from Connecticut, Massachusetts (first report), New York, Maryland, and Colorado.

Halo Blight (Bacterium medicaginis phaseolicola). Prominent infection in Massachusetts on bush limas growing beside heavily infected snap beans.

Scab (Elsinoe canavaliae). Reported from Porto Rico and observed in United States on pods shipped from Cuba and Porto Rico. P. D. R. 96, 97.

### C R U C I F E R S

#### C A B B A G E

Yellows (Fusarium conglutinans). Severe in North Carolina on the summer crop in sandy soil areas; a single specimen received in Pennsylvania and Mississippi; severe in some plantings in New Jersey with losses about normal; much less than usual in West Virginia; rare in Arkansas, and prevalent as usual in Kansas. Other States reported losses as follows: Maryland, 8 per cent; Missouri, 2 per cent; Texas and Wisconsin, 1 per cent; New York and Minnesota, traces; also reported from Indiana and Virginia. P. D. R. 162, 176.

Black Rot (Bacterium campestre) was very common at harvest time in Delaware, and was common and important in Arkansas. Heavy infection was reported on the winter crop in the Mobile section of Alabama with 25 per cent loss in some fields. It was said to be widespread and destructive on young plants in Florida. Two per cent loss was reported in Texas. P. D. R. 141, 162, 176, 209.



Downy Mildew (Peronospora parasitica). Especially severe in seed beds in Virginia and Florida; also reported from Massachusetts (first report to the Survey), Connecticut, New Jersey, and Texas. P. D. R. 141, 217.

Bacterial Spot (Bacterium maculicolum). Slight losses in Massachusetts and Porto Rico (first reports to Survey); scattered but unimportant in Florida. P. D. R. 141.

Rot (Botrytis sp.). Pennsylvania, more than usual due to dashing showers and hot weather.

Head Rot (Rhizoctonia sp.). Texas; Wisconsin, more than usual, late in season.

Lightning Injury. Wisconsin and New York.

#### C A U L I F L O W E R

Bacterial Spot (Bacterium maculicolum) and Black Leaf Spot (Alternaria brassicae) were reported from Massachusetts for the first time. P. D. R. 209.

#### H O R S E R A D I S H

Leaf Spot (Bacterium campestre armoraciae). South Dakota, trace loss, first report to Survey.

Fern Leaf (virus?). New York, 100 per cent infection in one field. (Chupp).

#### R U T A B A G A

These diseases were reported from Massachusetts for the first time to the Survey.

Black Leaf Spot (Alternaria brassicae), slight damage. Dark Center (non-parasitic, see turnip), 5 per cent loss in Berkshire County. Black Rot (Bacterium campestre), slight damage in one county.

#### T U R N I P

Black Leaf Spot (Alternaria brassicae), Leaf Spot (Cercospora albo-maculans) and Dark Center (non-parasitic) were reported from Massachusetts for the first time. Dark center was general, but was more damaging on the Cape where infections varied up to 25 per cent. The total loss was 5 per cent. It is attributed to unfavorable growing conditions.

Basal Rot (Pythium sp.). New York, a semi-firm basal rot observed in several fields.

### CUCURBITS

Mosaic (virus). Mosaic was reported to be increasing in importance on all cucurbits in the Imperial Valley. In New York, 100 per cent infection was observed in one field with no weed hosts nearby. P. D. R. 175, 209.

### CUCUMBER

Downy Mildew (Pseudoperonospora cubensis). Infections were unusually severe in Virginia and Florida, with losses of 50 per cent and from 33.3 to 50 per cent, respectively. In Massachusetts, the usual amount occurred on the fall crop in greenhouses, where the disease may readily be controlled by proper regulation of temperature and humidity (Guba); in field plantings, less commercial loss than usual, 5 per cent. In Wisconsin, the disease appeared in greenhouses, but was held in check in the field by dry weather. Maryland, New Jersey, South Carolina, and Texas reported minor losses. P. D. R. 143, 188, 189.

Bacterial Wilt (Bacillus tracheiphilus). P. D. R. 131, 177, 197.

Table 63. Losses from bacterial wilt of cucumber as estimated by collaborators, 1930.

Percentage:		Percentage:	
loss	States reporting	loss	States reporting
10	Massachusetts	0.5	Maryland
5	West Virginia	Trace	Missouri, Texas, Wisconsin
1.5	New York, New Jersey		

Mosaic (virus). In Massachusetts total loss was observed in one greenhouse, following a crop of water cress heavily infested with aphids. Commercial growers in New York secured good control by destroying weed hosts near the greenhouses. P. D. R. 160, 188, 198.

Table 64. Losses from cucumber mosaic as estimated by collaborators, 1930.

Percentage: loss :		States reporting		Percentage: loss :		States reporting	
10 to 15	:	New York		2	:	Maryland; Wisconsin	
5	:	Massachusetts,		1	:	Virginia	
	:	Florida			:		
	:			Trace	:	Texas, Michigan	

Angular Leaf Spot (*Bacterium lachrymans*). This disease appeared to be held in check by dry weather in most of the States reporting. Scattering infections of minor importance were observed in Massachusetts (first report for that State). In New Jersey, severe infections occurred in Atlantic County. P. D. R. 131, 188, 198.

Leaf Blight (*Macrosporium cucumerinum*). Losses from this disease were reduced to a minimum, apparently by dry weather. P. D. R. 218.

Scab (*Cladosporium cucumerinum*). A severe outbreak with a loss of 50 to 75 per cent occurred in one greenhouse in Minnesota.

Root Knot (*Caconema radiciicola*). Minor losses occurred in Texas and Washington. In Massachusetts, the disease was important as usual in greenhouses, causing an estimated loss of 3 per cent. Satisfactory control was secured with carbon disulphide emulsion. (Guba).

Snakehead (mechanical injury). Florida. P. D. R. 188.

#### C I T R O N

Downy Mildew (*Pseudoperonospora cubensis*). Citron is observed commonly in Florida as volunteer plants growing wild in fields and along woods, and is considered a source of downy mildew inoculum for fall crops of cucumber and other cucurbits. P. D. R. 189.

#### C A N T A L O U P E

Leaf Blight (*Macrosporium cucumerinum*). Loss estimates in general from States in the drought area indicated less damage than usual, traces up to 0.5 per cent. Maryland and Wisconsin reported much less blight than normal. In Florida, on the other hand, the disease was destructive. In Colorado, damage was limited to light, local infections in the Arkansas Valley. Massachusetts, New Jersey, North Carolina, Texas, and Arkansas reported unimportant losses. P. D. R. 188, 198.



Downy Mildew (Pseudoperonospora cubensis). In Maryland and North Carolina, where losses of 15 per cent occurred in 1929, the disease was much less important than usual in 1930, causing only 0.5 per cent loss in Maryland. In Massachusetts, the disease was normal, with 5 per cent loss, and caused severe defoliation in many late plantings. Delaware reported more downy mildew than usual. Florida and Louisiana reported heavy defoliation. Texas, also, reported severe infections with 3 per cent loss. Slight losses occurred in other States. The results of a spraying test conducted in 1929 in North Carolina are given on Pages 69-70 of the 1930 Reporter. P. D. R. 69, 143, 188, 198.

Anthracnose (Colletotrichum lagenarium). The unusually dry weather was thought to account for the marked reduction of losses in Maryland and Wisconsin, 0.1 per cent and a trace, respectively. Kansas, also, reported less anthracnose than usual, and Delaware much more. In North Carolina, the disease appeared in many fields but caused little damage.

Mosaic (virus). In Albany and Schenectady Counties, New York, heavy infections were observed on farms where the plants were started in greenhouses and where little attention was given to weed hosts; loss, 3 to 5 per cent. In addition to the "white pickle" mosaic, another kind of mosaic on muskmelons was observed by Chupp: "Two distinct mosaics were present on muskmelon. The most common one was the regular type usually described as white pickle. The second caused dwarf plants, but the affected leaves were not cupped downward nor did they show any rugosity. The leaves were very distinctly mottled but remained perfectly flat. The disease was transmitted by rubbing diseased leaves against healthy leaves on young plants in the greenhouse. It did not seem to go over on cucumbers in the field, even when cucumbers were growing immediately adjoining affected muskmelons. I observed the trouble only in the Lake counties."

Southern Blight (Sclerotium rolfsii). Texas, 2 per cent loss; Arkansas, 10 per cent loss due to fruit rot.

Scab (Cladosporium cucumerinum). Massachusetts, a trace. P. D. R. 198.

Fusarium Wilts. In Missouri the loss of 2 per cent caused by F. niveum was about normal. Chupp reports that "When inoculations were made" with the Fusarium isolated from a wilt in New York, described on Page 160 of the 1930 Reporter, "there was a hundred per cent infection and killing of young plants. Re-isolations of the same Fusarium were made."

Leak (Rhizopus sp.) and Leathery Rot (Fusarium spp.) were reported for the first time from Arizona. P. D. R. 173.

Ring Spot (virus). Virginia, 40 per cent infection in one planting; proved by Henderson to be due to the same virus that causes ring spot of tobacco. P. D. R. 187.

Dodder (Cuscuta arvensis). A specimen collected in Maryland by Dr. Waite.

### S Q U A S H

Powdery Mildew (Erysiphe cichoracearum). Severe infections were reported from Florida, North Carolina, and Texas. Slight losses of both summer and winter squashes occurred in Connecticut and Massachusetts. The disease was less important than usual in New Jersey. P. D. R. 188.

Bacterial Wilt (Bacillus tracheiphilus) was the most important disease of both summer and winter squashes in Massachusetts and caused a loss of 10 per cent. P. D. R. 198.

Mosaic (virus). In Florida, occasionally damaging but generally of little importance; also in New Jersey, Mississippi, Texas.

Leaf Spot (Septoria cucurbitacearum). First report from Massachusetts 1 per cent loss on winter squash; less severe on summer squash. P. D. R. 199.

Rot (Melanopsamma sp.). Massachusetts, causing decay of fruit.

### P U M P K I N

Powdery Mildew (Erysiphe cichoracearum), was severe on the early crop in North Carolina.

Leaf Spot (Septoria cucurbitacearum). Massachusetts, general during latter part of season on all varieties observed.

Bacterial Spot ("Bacterium cucurbitae, presumably"). Indiana, chalky white spots on fruit. (Gardner).

### W A T E R M E L O N

Anthrachnose (Colletotrichum lagenarium) was more abundant than usual in Delaware and was very severe in late maturing crops. It caused a loss of 12 per cent in Florida, was less severe than usual in Maryland with a loss of 5 per cent, and much less than for the average year in Kansas with an estimated loss of 2 per cent. New Jersey also reported less anthrachnose than normal, and North Carolina indicated much less damage than usual with only slight infection of even the latest plantings; Texas, 0.1 per cent loss.

Fusarium Wilt (F. niveum). Wilt caused 11 per cent loss in Missouri, attacked about 5 per cent of the acreage in the Imperial Valley of California, and was common and important in Arkansas. In Florida, the use each year of newly cleared land keeps the disease in check, loss 1 per cent. Other States reporting wilt were: Arizona, Indiana, Kansas, Michigan, Mississippi, New Jersey, Washington, Texas, and California. P. D. R. 143, 163, 209.

Bacterial Wilt (Bacillus tracheiphilus) was observed for the first time in Massachusetts, general, 5 per cent loss.

Downy Mildew (Pseudoperonospora cubensis). Massachusetts, Mississippi. P. D. R. 189.

Stem-End Rot (Diplodia sp.). Texas, 1 per cent loss; Missouri, 2 per cent loss.

Proliferation of floral parts, resulting in non-bearing plants, was reported from one locality in South Carolina.

#### C E L E R Y

Yellows (Aster yellows, virus). In Michigan, high soil temperatures and generally unfavorable growing conditions were factors conducive to a severe outbreak of yellows for the second successive year. It was severe in some fields of yellow varieties. Loss 2 per cent. (R. Nelson). Wisconsin also reported more damage than usual. P. D. R. 177.

Black Heart (non-parasitic). More than usual in Wisconsin, caused a loss of 5 per cent.

Oedema, Cracked Stems (climatic). Attributed in New York to sudden rains following hot, dry weather; local in Massachusetts, accompanied by stunting and heart rot. P. D. R. 217.

#### P E A

Bacterial Blight (Bacterium pisi). Outbreaks of unusual importance occurred early in the season in New York, Wisconsin, Michigan, Minnesota, and Arizona, following periods of cool, wet weather or driving rains. Infections became less important as the season progressed. Infected pods shipped from Florida were observed on the Cincinnati market. Loss estimates from States are as follows: Michigan, 2 per cent; Minnesota, 0.5 per cent; New York, trace to 1 per cent; Wisconsin, trace.



Root Rot (Aphanomyces euteiches). In Maryland, losses were less than usual, 3 per cent, due to the extremely dry weather. In Wisconsin, the disease was general and normal, with 8 per cent loss, and scattered with normal losses in New Jersey. Minnesota reported much more root rot than usual occurring mostly early in season in the southern part of the State; Alaska and Perfection, susceptible; 0.5 per cent loss. North Carolina reported infections in the eastern part of the State.

Other Root Rots. Fusarium spp. In Minnesota the following varieties were said to be resistant: Horal, Roger's Green, Roger's K; while Perfection and Alaska were susceptible. Scattering infections were indicated in Massachusetts, Arizona, and Washington. A loss of 1 per cent in Colorado was reported to be due to F. martii.

Rhizoctonia spp. Heavy infections in low, wet soil in Massachusetts; caused seedling blight in Minnesota.

Ascochyta pinodella. Washington.

Undetermined. Severe infection of roots and lower stems of seedlings in certain lots of seed in Massachusetts. Three to 5 per cent loss in Tompkins County, New York, on Advancer and Lincoln in soil in which diseased plants were observed last year. Earlier plantings of Alaska and Advancer a few feet away on non-infected soil were affected only slightly.

Wilt (Fusarium spp.). In Minnesota, less damage than usual was reported, with a loss of 0.5 per cent. The following varieties were cited with regard to susceptibility and resistance: Resistant, Admirals, Rice's 13, Horal; susceptible, Badger, Thomas, Santiago, Giants, Telephone; very susceptible, Surprise, Alaska, Perfection. New Jersey reported severe infection, associated with the Aphanomyces root rot, in a few fields where rotation was not practiced, and Washington received one report from an eastern county. F. orthoceras pisi: H. A. Hunter estimated the loss in Maryland at 1.5 per cent but remarked that the crop was so severely injured by dry weather that it was practically impossible to observe the effect of the disease. It occurs principally in western Maryland. A loss of 5 per cent was reported from Wisconsin.

F. tracheiphilum: Wilt reported to be caused by F. vasinfectum tracheiphilum was observed in two counties in Mississippi.

Anthrachnose (Colletotrichum pisi) was found for the first time in Maine on the pods, stems, and leaves of Gradus, Dwarf White Sugar, Blue Bantam, and Telephone. This disease has been known in Wisconsin for some time. In recent years it has been observed in Minnesota and Georgia. P. D. R. 182.

Leaf Spot (Septoria sp.). Observed in only one planting in Massachusetts.

"Scorch" (high temperature; low rainfall). Much worse in Wisconsin than usual, causing a total loss of 15 per cent; most severe on sweet varieties during June and July.

## OTHER VEGETABLES

### ASPARAGUS

Rust (Puccinia asparagi). The aecidial stage was observed in Wisconsin on winter onion in one garden.

Stem Rot (Fusarium sp.). General in Massachusetts and worse in drier sections; observed in South Carolina with F. moniliforme and F. semilectum associated. P. D. R. 197.

Blight (Ascochyta asparagina). Texas.

### B E E T

Mosaic (virus). Plantings for seed in Washington showed an average of 60 per cent infection. P. D. R. 176.

Canker (high temperature). Much more severe in Wisconsin than usual, causing a loss of 37 per cent; heavy losses in Ontario County, New York. ("Girdle or drought spot"); prevalent in one field in Massachusetts on heavy but moist soil ("root cracks").

### C A R R O T

Leaf Blight (Macrosporium carotae) and Leaf Spot (Cercospora apii carotae) were reported from California for the first time. They occurred together in Santa Barbara County. P. D. R. 200.

Dodder (Viscusa arvensis). Heavy infection in one twenty acre field in Texas.

Yellows (Aster yellows virus). New York, Wisconsin.

Root Rot (Phymatotrichum omnivorum) caused losses of 50 to 100 per cent in some fields in Hidalgo County, Texas, late in the spring.

## LETTUCE

Drop (Sclerotinia sclerotiorum). In New York, 10 per cent loss was observed in Orange County with 1 to 2 per cent damage for the State. Local infections were reported from New Jersey and Washington.

Mosaic (virus). Losses of 2 to 3 per cent were reported from New York. Mosaic occurred also on the wild host plants Lactuca scariola and L. scariola integrata. Slight loss as usual in New Jersey.

Bottom Rot (Corticium vagum). Losses in four New York counties of 10, 15, 30 and 40 per cent, respectively, with an estimate of 10 to 15 per cent loss for the State. One per cent loss was reported from Texas.

Wilt (Pythium sp.) New York, trace of loss; Romaine and New York susceptible. One report was received in Washington.

Wilt (Bacterial undetermined). A loss of 30 per cent was observed in one field in Norfolk County, Massachusetts. P. D. R. 199.

Yellows (Aster yellows virus) was much less important than usual in New York with losses up to 3 per cent. Also reported from Massachusetts, Texas, and Wisconsin.

Tipburn (non-par.) More than usual in New Jersey, also in New York where the loss was estimated at 10 per cent; abundant on head lettuce in North Carolina; normal amounts in Wisconsin.

"Strangulation." (Prolonged irrigation plus high temperature). Arizona. P. D. R. 216.

## ONION

Downy Mildew (Peronospora schleideni) was severe in Camden County, New Jersey, where it caused 50 per cent loss in some fields. It was severe on the seed crop and caused at least 5 per cent loss in Sacramento and Santa Clara Counties, California. The drought checked infection in New York.

White Rot (Sclerotium cepivorum). Reported from Virginia, the first survey report since 1925 when the disease was reported from Virginia and Kentucky. P. D. R. 82, 83, 104, 105.

Rust (Uromyces bicolor). Texas.



Yellow Dwarf (virus). Observed in one small patch in San Mateo County, California; first report from that State.

Top Blight and Root Rot (Unknown). Common in Massachusetts in the spring on crops grown from sets. Thought to be due to root infection following injury from dry weather and fertilizers.

#### P A R S N I P

Leaf Spot (Ramularia pastinacae). First report to the survey from Massachusetts; scattered infections with a trace of loss.

#### R H U B A R B

Crown Rot. Phytophthora cactorum caused important loss in Pennsylvania for the first time since 1923. The loss was estimated at 20 per cent. It was most severe in new plantings. Rhizoctonia sp. caused 4 per cent loss in Texas.

Root Rot. Phymatotrichum omnivorum caused 50 per cent loss in Texas. Fusarium sp. was reported from Washington.

#### S A L S I F Y

Yellows (aster yellows virus). Slight loss in plantings adjacent to asters in Wisconsin. Trace of loss in Nassau County, New York.

#### S P I N A C H

Downy Mildew (Peronospora effusa) was more important than usual in Nassau County, New York, where losses ranged from 5 to 90 per cent with an average of 20 per cent. In other parts of the State, however, there was only a trace, and the total loss was between 5 and 10 per cent. Several large plantings on muck soils in Michigan were almost completely destroyed in October. The loss for that State was 10 per cent. Other losses reported were 5 per cent in Virginia and Texas, 2 per cent in Massachusetts, 0.5 per cent in Maryland. The disease was also reported from Pennsylvania, New Jersey, Washington.

Leaf Spot (Heterosporium variable) was general and caused a loss of 20 per cent in Virginia. One report in California.

Wilt (Fusarium sp.) caused 4 per cent loss in Virginia.

## DISEASES OF SPECIAL CROPS

### COTTON

Anthrachnose (Glomerella gossypii) was very severe in the extensive cotton growing region of Southeastern Missouri, where the loss was estimated at 8 per cent. (I. T. Scott). In other States there was less damage than usual. Losses reported, besides that in Missouri, are 2 per cent in Florida and Louisiana, 0.5 per cent in South Carolina, and traces in North Carolina, Arkansas and Texas.

Angular Leaf Spot (Bacterium malvacearum). This disease, like anthrachnose and nearly all other leaf and boll spotting diseases, was reduced to a minimum by the unusual dry weather in the cotton States. Florida and Texas reported 2 per cent loss, North and South Carolina, 1 per cent, other States traces.

Fusarium Wilt (F. vasinfectum). In general, cotton States reported less wilt than usual. However, badly infested soils in North Carolina showed just as much wilt as during the two previous seasons. Wilt was reported on Cecil sandy soils in Piedmont counties this year. Normally it is confined to the Sand Hill and Coastal Plain areas on soils of the Norfolk series. Good soils and poor ones have shown equally high percentages of infection but the more fertile soils yield better than poor sandy soils even when wilt is severe. (R. F. Poole). In South Carolina also there was just as much wilt as usual. The disease is slowly spreading through the Coastal Plains and in sandy spots in the Piedmont. (Geo. M. Armstrong). In Arkansas the incidence of wilt was much reduced due to dry weather. There was a great increase after rains in September but too late to do excessive damage. (V. H. Young). Resistant varieties give satisfactory control and a number of States reported increase in their use. Losses reported are 3 per cent in North Carolina, Louisiana, and Texas, 2.5 per cent in Arkansas, 1 per cent in South Carolina and Florida, 0.1 per cent in Georgia, and a trace in Missouri. P. D. R. 122, 185.

Verticillium Wilt (V. alboatrum) was observed for the first time in several counties in the Delta section of Mississippi. (Miles).

Black Leaf Spot (Macrosporium nigricantium). Hastened defoliation of "rust" plants in North Carolina.

Blight (Ascochyta gossypii) was more severe on young cotton plants in North Carolina than during the past two years. In some fields plants were greatly stunted due to heavy leaf infection before the first blossoms appeared. (R. F. Poole). On the other hand, in South Carolina there was almost entire absence of this disease as compared to widespread occurrence in several Piedmont counties in 1929. The very dry weather was probably a chief factor. (Geo. M. Armstrong). P. D. R. 101.

Root Rot (Phymatotrichum omnivorum). Five per cent loss in Texas. P. D. R. 122, 152, 185.

Damping Off, Sore Shin, Seedling Blight: Corticium vagum was general with considerable early reduction in stand and 1 per cent loss in Arkansas and Texas; also occurred in Louisiana and Mississippi. P. D. R. 101, 122. Cause undetermined. Cool wet weather in the Piedmont area of South Carolina led to the worst seedling losses in years. Actual surveys in two counties, Anderson and Greenwood, showed 40 per cent loss in stand. Later dry weather and no boll weevil damage allowed plants to make late growth and largely overcame ill effects of poor stand. (Geo. M. Armstrong). In Alabama, seedling diseases of all kinds were less than usual. Mississippi reported a stem-girdling of seedlings of unknown cause as common in the State.

Rust (Puccinia hibisciata, (Aecidium gossypii)) Arizona, Texas. The rust completely defoliated plants in spots in one field in Pinal County, Arizona, and probably reduced the crop by one-third. Cerotelium gossypii was reported from Arizona in the Plant Disease Reporter, Volume 14, Page 181. This was an error. The rust was reported to the Survey as Aecidium gossypii, which is the aecial stage of Puccinia hibisciata.

"Rust" (Non-parasitic). This disease was much more pronounced in Arkansas and Mississippi than usual, and more severe than usual in Louisiana, especially on early varieties. It was later than usual in North Carolina, but caused severe damage in some eastern counties. In general, the dry weather was considered as greatly favoring the disease.

Drought Injury. Arkansas and Texas reported from 25 to 30 per cent losses due to dry weather. P. D. R. 184.

Strangulation. Losses of 5 to 25 per cent locally in Texas. P. D. R. 184.

Sand Drown (Malnutrition), similar to the disease on tobacco and other plants, occurred in North Carolina on light sandy soils. The trouble was worse on Norfolk sands.



## H O P S

Downy Mildew (Pseudoperonospora humuli). This disease was reported for the first time from Washington and Oregon. Serious local outbreaks occurred in Oregon. P. D. R. 98.

## S U G A R C A N E

Mosaic (Undetermined). General in Louisiana with moderate losses as usual, 3 to 5 per cent. The disease was reported also from Mississippi and Porto Rico. In Louisiana, the following varieties were cited for resistance and susceptibility: Very resistant, P. O. J. 213, C. O. 281, C. P. 807; resistant, P. O. J. 36, 234; susceptible, Purple. The P. O. J. 213 is the most widely used variety in the sugar belt of that State.

Red Rot (Colletotrichum falcatum). Louisiana reported losses above normal. There was serious damage to cane planted in the fall of 1929, during the early months of 1930, especially in P. O. J. 213, but during the growing season of 1930 there was very little injury. No variety is immune. C. O. 281, P. O. J. 36 are resistant, and C. P. 807 and P. O. J. 213 are susceptible. (E. C. Tims). From extensive surveys in 1929 and 1930 in Louisiana, Dr. E. V. Abbott concludes that C. P. 807 is one of the most resistant varieties under field conditions, although it was found to be very susceptible when artificially inoculated. (R. D. Rands). Also reported from Mississippi and Porto Rico.

Mottled Stripe (Phytomonas rubrisubalbicans). Much less in Louisiana due to substitution of P. O. J. varieties for the D-74 cane.

Red Stripe (Phytomonas rubrilineans). In Georgia and Florida (where it was first observed in 1927) occasional diseased plants noted with little damage to commercial canes, Cayana and P. O. J. 213, which are apparently resistant. (R. D. Rands). Very little, less than usual in Louisiana.

## D I S E A S E S O F O R N A M E N T A L S

### A N E M O N E (ANEMONE SP.)

Stem Rot (Sclerotium rolfsii) was reported from Ventura and Los Angeles Counties, California, in 1929, but was not found this year. (Stout and Scott).

### C A L L A L I L Y (ZANTEDESCHIA AETHIOPICA)

Root Rot (Phytophthora richardiae). New York. P. D. R. 14: 94.

Sclerotium Disease (Sclerotium sp.). Oregon, California. P. D. R. 14: 205-206.

C A R N A T I O N (DIANTHUS CARYOPHYLLUS)

Root Knot (Caconema radiculicola). The greatest damage to the carnation plant in greenhouses in North Carolina is due to the root nema. In many instances the value of the crop is completely destroyed, especially when young plants become infected and moisture and temperature conditions in the greenhouse are favorable for the development of the nemas. (R. F. Poole).

Mosaic (undet.) What appeared to be a mosaic disease was observed on plants growing in several greenhouses in New York. Affected plants were noticeably stunted. The mottling which was irregular in type, was most evident on the young leaves. Some varieties were more seriously affected than others (C. Guterman).

C A S T O R B E A N (RICINUS COMMUNIS)

Bacterial Wilt (Bacterium solanacearum). Michigan, one specimen from house plant.

C H I N A A S T E R (CALLISTEPHUS CHINENSIS)

Dodder (Cuscuta sp.). Massachusetts.

Stem Rot (Sclerotium rolfsii), Mississippi. This seems to be the first report on this host to the Survey.

Leaf Spot (Septoria callistephi) was found ruining a ten-acre field in Berks County, Pennsylvania (G. L. Zundel). P. D. R. 14: 202.

Yellows (virus) was widespread and important, as usual. Losses of 60 and 25 per cent were reported from Michigan and Kansas, respectively. Nelson, in Michigan, states that the very dry weather was favorable for leaf hoppers, and the disease appeared early. It was observed on wild lettuce in June.

Wilt (Fusarium conglutinans callistephi). P. D. R. 14: 133, 181, 182.

Stem Blight (Botrytis sp.). Connecticut, New York.

C O S M O S (COSMOS SP.)

Root Rot (Rhizoctonia sp.). See snapdragon.

C R O C U S

Dry Rot (Sclerotium gladioli) on C. nudiflorus from New Jersey.

C Y C L A M E N (CYCLAMEN SP.)

Botrytis sp. STEM ROT reported from Washington. BLIGHT due to soft rot of the flower shoots near the crowns was serious in a greenhouse in New York. Controlled by removal of diseased shoots and lowering of greenhouse humidity. (C. Guterman).

F R E E S I A (FREESIA SP.)

Dry Rot (Sclerotium gladioli). New Jersey.

H O L L Y H O C K (ALTHEA ROSEA)

Bacterial Wilt (Bacterium solanacearum) was reported from a garden at Ithaca, New York, on young hollyhock plants and on Hydrangea arborescens, apparently for the first time on both hosts. The disease was probably introduced with the Hydrangea plants which were obtained from the South. The entire hedge of Hydrangea was destroyed while only occasional plants of the hollyhock were affected. (Charles Chupp, P. D. R. 14: 133).

H Y A C I N T H (HYACINTHUS SP.)

Yellow Disease (Bacterium hyacinthi). About 2 per cent of the plants affected in one large greenhouse planting in Detroit, Michigan.

Nematode (Tylenchus dipsaci). New Jersey, on greenhouse forcing stock.

I R I S (IRIS SPP.)

Leaf Blight (Kabatiella microsticta) on I. germanica in Oregon, first report.

Rust (Puccinia iridis) on I. versicolor in Massachusetts. P. D. R. 14: 202.

Root Rots. The following reports are the first from the respective States to the Survey. Basal Rot (Sclerotium delphinii) on I. germanica in New York. Crown Rot (S. rolfsii) in North Carolina and Kansas.

Mosaic (virus) is rather prevalent on German iris in New York but without much evidence of injury. It causes serious injury to bulbous iris, however, in the form of stunting, distortion, and flower reduction (C. Guterman). Also reported from Montana.



L A R K S P U R (DELPHINIUM SPP.)

Black Spot, Bacterial Blight (Bacterium delphinii) was reported from southern New England, New Jersey, New York, Ohio, Michigan, from Nebraska for the first time, and from Washington. In Massachusetts the disease caused blighting of the young stems in some cases. Severe defoliation occurred in the Botanical Garden collection of hybrids in Michigan. It had not been observed previously for several years. It was also seen on seedlings in other plantings.

Rust (Puccinia clematidis) is severe in North Carolina. The susceptibility of this plant to rust in the field seriously interferes with its popularity. In the greenhouse the disease also mars the appearance of the plant when a large percentage of the leaves are destroyed. (R. F. Poole).

A Virus Disease, the virus of which caused coarse etch when transferred to tobacco, was reported from Kentucky. P. D. R. 14: 118.

L I L Y (LILIUM SPP.)

Blight. Botrytis sp. occurred on Lilium auratum in New Jersey and on L. candidum (Madonna lily) in Massachusetts, Michigan, and Washington. It is becoming very destructive in the field in Michigan. Botrytis elliptica was reported from New York where L. candidum was said to be most susceptible, but L. testaceum and L. superbum were also very susceptible. It was serious on several varieties of L. longiflorum under glass.

Gray Mold (Botrytis cinerea). Michigan, destructive in greenhouses where careless watering was done.

Mosaic (virus) was reported from Massachusetts, New York, Pennsylvania, and Washington. P. D. R. 14: 201.

M O N K S H O O D (ACONITUM SP.)

Root Knot (Caconema radicicola) was reported from an estate in Nassau County, New York.

Base Rot (Sclerotium delphinii) was also reported from New York in Westchester County. Both of these seem not to have been reported on Aconitum previously. (C. Guterma).

N A R C I S S U S (NARCISSUS SPP.)

Blight. (Botrytis sp.). Washington.

Fire (Botrytis narcissicola). Washington.

Ramularia Blight (R. vallisumbrosae). Oregon. D. D. R. 15: 3-4. 1931.

Nematode (Tylenchus dipsaci). Reported from Alabama, Michigan, Washington, and California. One shipment of 2,000 bulbs of King Alfred to Michigan from the West produced badly diseased plants.

Mosaic or Gray Disease (virus). New York, Michigan, Washington. This is the most important disease in some varieties of daffodils in Michigan. As high as 50 per cent of the plants were observed to be affected in several large plantings. (R. Nelson).

#### P E T U N I A (PETUNIA SPP.)

Ringspot (virus). Virginia, natural infection. P. D. R. 14: 166.

#### S N A P D R A G O N (ANTIRRHINUM MAJUS)

Root Knot (Caconema radicum) was reported from New York. Young seedlings in two-inch pots were seriously affected. The plants were stunted and made little or no growth. The leaves were slightly distorted. (C. Guterman). This seems to be the first report on this host from New York.

Root Rot, Collar Rot (Rhizoctonia sp.) of snapdragon, cosmos, marigolds was serious in affected gardens in Brazos County, Texas. In some cases as many as 80 per cent of the plants were killed. Isolations from infected roots produced pure cultures of Rhizoctonia sp. The disease was most prevalent during the summer and was most severe after watering. It subsided with the advent of cooler fall weather. (J. J. Taubenhau).

#### S W E E T P E A (LATHYRUS ODORATUS)

Leaf Spot (Isariopsis griseola) was reported from Connecticut, apparently for the first time on this host.

Root Knot (Caconema radicum) was very serious on the fall crop in Massachusetts, causing heavy loss in many cases. Its prevalence seems to have been due to high temperatures prevailing in August, September, and October. Usually it is not an important disease of sweet peas and is rarely observed. (E. F. Guba).

#### S W E E T W I L L I A M (DIANTHUS BARBATUS)

Stem Rot (Sclerotium rolfsii) severe in North Carolina.

Anthracoze (Volutella dianthi). New York. P. D. R. 14: 87.

T U L I P (TULIPA SPP.)

Blight (Botrytis tulipae) was reported from New York, Mississippi, Michigan, Nebraska and Washington. In Michigan it was very severe on tulips out-of-doors. The flowers were completely blasted in nearly all plantings observed. The disease was very severe on one large planting at Pullman, Washington. It has been fairly common in western Washington, but this was the first severe case reported for eastern Washington. P. D. R. 14: 181.

Gray Bulb Rot (Rhizoctonia tuliparum). Massachusetts, on bulbs imported from Holland. P. D. R. 14: 78.

W A T E R L I L Y (NYMPHAEA SPP.)

Smut (Entyloma nymphaeae). District of Columbia. P. D. R. 14: 118.

D I S E A S E S O F O R N A M E N T A L S H R U B SB A R B E R R Y (BERBERIS SPP.)

Wilt (Verticillium alboatrum) on Japanese barberry (B. thunbergi), Hampden County, Massachusetts. P. D. R. 201.

B O X (BUXUS SEMPERVIRENS)

Leaf Blight (Macrophoma candollei) was serious in a large planting in Ste. Genevieve County, Missouri. This is the first time it has been reported in the State (I. T. Scott). In North Carolina the disease was especially prominent on plants severely injured by low temperatures (R. F. Poole).

Winter Injury. Young plants with yellow leaves and dead branches were sent from nurseries in North Carolina during the winter and the same condition was observed on older plants. The injury was caused by sudden low temperatures during the early part of November. (R. F. Poole).

C O T O N E A S T E R

Blight (Bacillus amylovorus). Arizona on C. pannosa. P. D. R. 14: 166, 182.

Sphaeropsis malorum (=Physalospora malorum) on C. franchetti cinerascens, New York. P. D. R. 14: 248.



E U O N Y M U S

Crown Gall (Bacterium tumefaciens). Michigan, on E. radicans.

H Y D R A N G E A

Bacterial Wilt (Bacterium solanacearum). New York, see hollyhock.

L I L A C (SYRINGA SPP.)

Bacterial Blight (Bacterium syringae). One nursery in New York in which this disease was serious on French hybrids in 1929 cut out all affected shoots that season. This year only one or two plants were affected. (C. Guterman). Also reported from Washington.

Die Back (Phytophthora cactorum). Reported from New Jersey.

P A C H Y S A N D R A (PACHYSANDRA SP.)

Blight (Volutella buxi) caused dying of Pachysandra on an estate at Stamford, Connecticut.

P R U N U S SPP.

Brown Rot (Sclerotinia fructicola) was reported on flowering almonds from Connecticut (on P. glandulosa) and Illinois (on P. japonica), and on the purple leaf plum, P. cerasifera pissardi, from Connecticut. P. D. R. 14: 94.

R O S E (ROSA SPP.)

Mosaic or Infectious Chlorosis (virus) was reported from Wisconsin, Michigan, and the Pacific Coast. Two new cases in Michigan were traced to diseased stock from Oregon and California. Dr. Freeman Weiss reports the results of a survey in Pacific Coast States and in Texas in the Reporter, Volume 14, Pages 203-206. Further observations on the disease in Oregon are given by F. F. McWhorter in Volume 15, Pages 1-3. (Feb. 1, 1931).

S P I R A E A (SPIRAEA SPP.)

Blight (Bacillus amylovorus). Virginia on S. vanhouttei. P. D. R. 14: 133.

## DISEASES OF TREES

### CONIFERS

White Pine Blister Rust (Cronartium ribicola). The outstanding development in the white pine blister rust situation in the United States during 1930 was the discovery of the rapid increase of the rust in the western white pine region of eastern Washington, northern Idaho, and western Montana. In this region western white pine (Pinus monticola) is the chief commercial timber tree on more than 3,000,000 acres of land that is predominantly unsuited for agricultural use. The economic life of the region is founded upon the forest industries, which do a business of \$35,000,000 to \$40,000,000 annually in white pine products. About 60 per cent of this money is distributed in pay-rolls. White pine is the basis of the industry and constitutes 75 per cent or more of the value of the lumber output of the region. Lumber of the other native tree species does not now sell for enough to pay the costs of logging, manufacture and transportation to the great consuming centers of the country. The loss of the white pine would mean economic disaster to the region. About one-half of the white pine land is government-owned and within the national forests. The remainder is owned by the States and private owners. These areas are intermingled and a large percentage of them bear young stands. Since the future timber supply depends upon the young stands and reproduction, the protection of the young growth is fully as important as the protection of the stands now merchantable.

Scouting during the season resulted in the location of 11 new centers of pine infection in Idaho; 4 near Headquarters and Pierce, 1 on the Clearwater National Forest, 4 in the vicinity of Elk River, 1 near Clarkia, and 1 on the St. Joe National Forest. Diseased Ribes were found at 16 points; 1 on the Clearwater National Forest, 6 on the lands of the Clearwater Timber Protective Association, and 9 in the St. Joe River drainage. In adjacent Montana, new Ribes infections were found at 4 points near Haugan. Both the western white and sugar pine (P. lambertiana) are more susceptible to the disease than the eastern white pine and wild Ribes are generally more numerous than in eastern forests.

In the Pacific Coast Region, a new center of pine infection was located in Oregon on Roaring River, Clackamas County, and another on Minto Creek in Linn County near Independence Ranger Station. The latter is the most southern point in the West at which pine infection has been located. Diseased Ribes were found at two points in Linn County on Thomas Creek and Minto Creek, and on Roaring River in Clackamas County. These infections show that the rust is gradually approaching the valuable sugar-pine forests of southern Oregon and California.

In the eastern United States there was no change in the infested area during 1930. Limited scouting in the Appalachian region south of Pennsylvania gave negative results. No systematic search of the rust was made in the region south of the Lake States because of drought conditions. Within the infested region the rust causes serious damage to white pines (P. strobus) in unprotected areas. (J. F. Martin)

#### S A V I N (JUNIPERUS SABINA)

Crown Gall (Bacterium tumefaciens). Specimens of Juniperus sabina showing galls on the crown and roots were received from L. E. Miles of Mississippi. Bacterium tumefaciens was isolated by Miss Nellie A. Brown from the galls on the stock at and below the graft. This report is unusually interesting because of the fact that the host is a conifer. It seems to be the first record of crown gall on J. sabina.

#### S P R U C E (PICEA SPP.)

Canker (Cytospora sp.) was reported on the Colorado blue spruce (P. pungens glauca) from Massachusetts, and on Koster's blue spruce (P. pungens kosteri) from New Jersey. In Massachusetts the disease was observed by Boyd in three counties and was reported from a fourth. It made rapid progress in some trees in Hampshire County.

#### H A R D W O O D S

##### B L U E G U M (EUCALYPTUS GLOBULUS)

Drought. In Southern California drought caused very general dying on non-irrigated trees, affecting windbreak rows or groves in a very scattered way - good trees alternating with dead ones. (Wm. T. Horne).

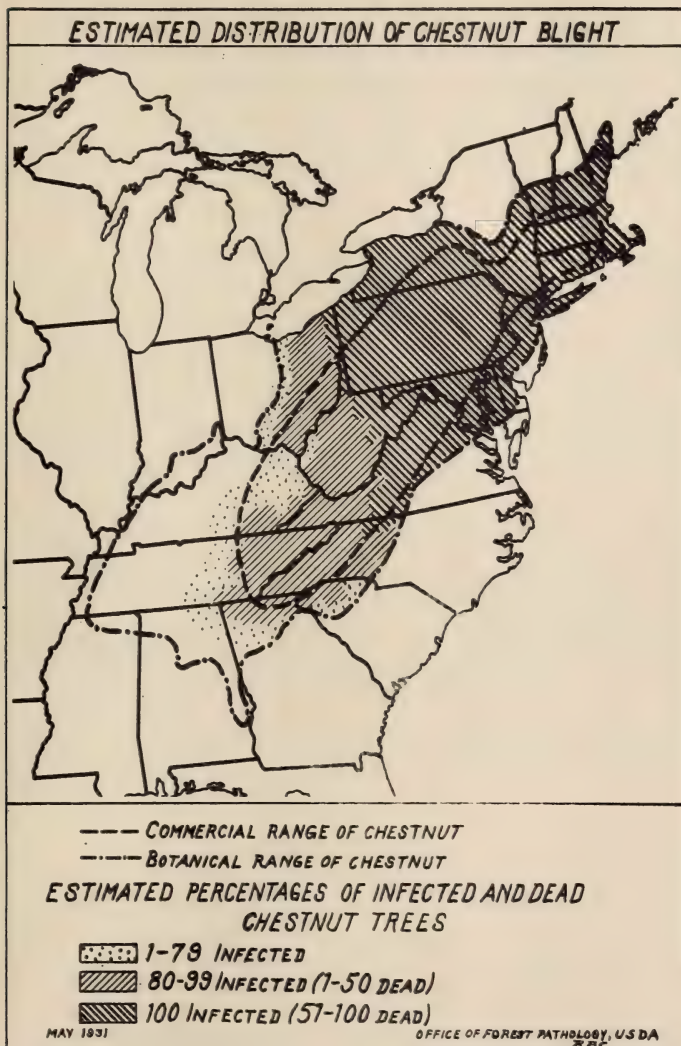
##### C H E S T N U T (CASTANEA DENTATA)

Blight (Endothia parasitica). Estimates received by the Division of Forest Pathology in 1930 on the distribution of chestnut blight do not indicate any unusual spread, but the combination of it and drought is expected to work havoc with chestnut in some localities. The full extent of such injury will not be known until reports are received for 1931.

A detailed survey was made in Ohio by O. N. Liming, who estimated that in the eastern half of the State approximately 80 to 99 per cent of the chestnut was infected and 1 to 50 per cent dead.

The accompanying map (Figure 25) shows the estimated distribution of the chestnut blight in the eastern United States. (R. B. Clapper).





**Figure 25.** Estimated distribution of chestnut blight in 1930.  
 (Map by R. B. Clapper).



E L M (ULMUS SPP.)

Dutch Elm Disease (Graphium ulmi). For some years plant pathologists in this country have been watching for the Dutch elm disease (Graphium ulmi Schwarz) which has caused the widespread death of elms in various countries in Europe. In the summer of 1930 it was first found in this country at Cleveland, Ohio, and was identified independently by Dr. Christine Buisman, a Dutch plant pathologist then travelling here, and by Curtis May.

During 1930, as a result of survey work and cooperation from plant pathologists, tree surgeons, and others, many specimens of diseased elms were sent to the cooperative laboratory maintained at Wooster, Ohio, by the Ohio Agricultural Experiment Station and the Division of Forest Pathology of the Bureau of Plant Industry, United States Department of Agriculture. From the large number of specimens submitted in 1930, those from only four trees were found to be infected by the Dutch elm disease. Three of these trees were in Cleveland and one in Cincinnati, Ohio.

At present it is often impossible to state from a field examination whether a wilted elm has or has not the Dutch elm disease. The most confusing symptoms were those caused by species of Verticillium and Cephalosporium-like fungus. All of these organisms appeared to be rather virulent parasites on elm. Quite a number of specimens of Sphaeopsis twig blight of the elm were also received.

For further details as to symptoms and other points about the Dutch elm disease, readers are referred to Department Circular 170, entitled "The Dutch Elm Disease."

The results for 1930 and to the present date for 1931 give some indication that there is comparatively little of this disease present in the United States and that there is still some hope of eradicating it. It is requested that pathologists continue to send in specimens of wilted elms to the Dutch Elm Disease Laboratory at Wooster, Ohio, or to culture them in their own laboratories. (G. F. Gravatt)

H A W T H O R N (CRATAEGUS SPP.)

Blight (Bacillus amylovorus). Connecticut, New Jersey, North Carolina, and Nebraska reported this disease. In North Carolina trees in woods showed heavy blossom infection.

Sclerotinia Blight (S. johansonii). Minnesota, on C. rotundifolia.



Rust (Gymnosporangium spp.). G. germinale and G. globosum were very severe on foliage and fruits in both ornamental plantings and in the extensive wild plantings in Missouri. G. germinale was also reported from New Jersey on C. occidentalis, from Washington on C. oxyacantha, and from North Carolina and Texas. G. globosum was reported from Long Island and North Carolina. P. D. R. 190, 241.

#### M A P L E (ACER SPP.)

Crown Gall (Bacterium tumefaciens) was reported again this year on the sycamore maple (Acer pseudoplatanus). Several more young trees which had been planted on the streets of Lansing were removed due to galls on the root systems. Dr. J. H. Muncie originally confirmed the diagnosis of this disease in 1929 (F. C. Strong). P. D. R. 14: 119.

Canker (Phomopsis sp.). On Japanese maple (A. palmatum rubrum), causing death of young stock and of branches on older stock, was reported from New Jersey.

#### M O U N T A I N   A S H (SORBUS SPP.)

Blight (Bacillus amylovorus). Connecticut.

Crown Gall (Bacterium tumefaciens). Connecticut, on S. aucuparia.

Black Rot (Physalospora malorum). New Jersey, on S. americana. First report to the Survey on this host.

Brown Bark Spot (non-par.). Washington.

#### O A K (QUERCUS SPP.)

Anthracnose (Gnomonia veneta) was reported from New England and New Jersey west to Wisconsin and Indiana, in almost all cases as more prevalent than usual and as particularly abundant on white oaks. Some white oak trees in Massachusetts showed as high as 90 per cent defoliation. Michigan reported it to be severe and more abundant than for the past ten years on white oaks, although there was very little on sycamores which are usually severely attacked every year. P. D. R. 14: 133, 152.

Chestnut Blight (Endothia parasitica). One report in Connecticut, on Quercus rubra, semi-saprophytic. (G. P. Clinton).

#### W I L L O W (SALIX SPP.)

Scab (Fusicladium saliciperdum). Clinton and McCormick reported that in Connecticut willow scab seemed to be on the decline in 1929 and 1930, apparently due to the dry seasons. At Norfolk the only willows left alive were sprayed trees, and these had better foliage than when spraying was started three years ago. The disease was also reported from Massachusetts where there was said to be more than usual in 1930. P. D. R. 14: 77, 118, 132, 153, 226.

1899

